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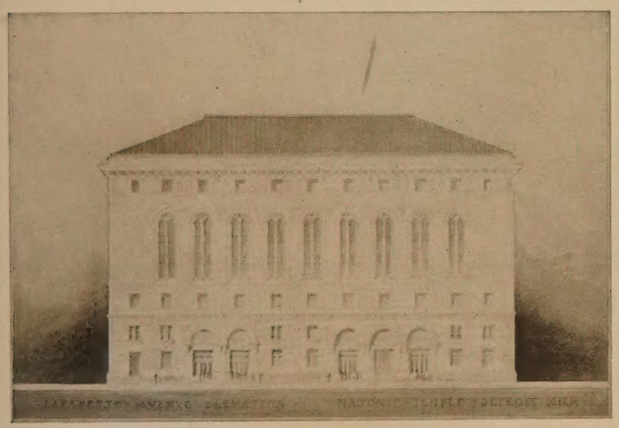
# Notes on the Preliminary Studies for the Great Masonic Temple at Detroit

George D. Mason & Co., Architects

THE fact that the proposed Masonic Temple at Detroit has attracted the attention of architects and laymen throughout the country would seem to indicate that there is a growing demand for more adequate housing of Masonic fraternities. The Detroit temple will be the largest in the world, containing 11,070,000 cubic feet, and will house all



Elevation of the original scheme—which contemplated facing the old brick structure with marble.

the bodies which form the association, viz: twenty-six Blue Lodges, the Royal Arch Chapters, the Council, Detroit and Damascus Commanderies, Michigan Sovereign Consistory, and the Moslem Shrine, which ordinarily exists as an isolated auditorium, the playground of Masonry.

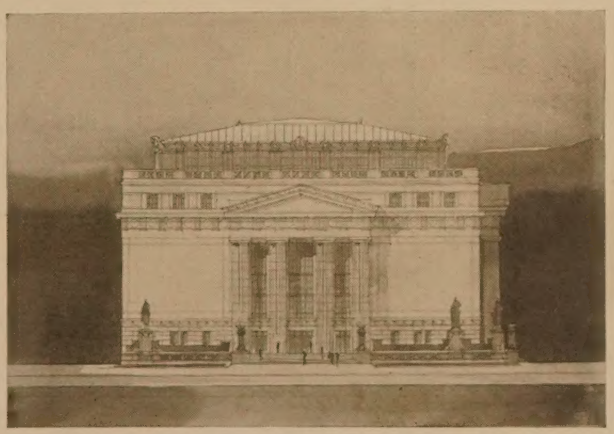
At the present writing the steel frame for the structure is rapidly going up, the principal contracts have been let, and it is confidently expected that the building will be completed as designed to the last detail. A retrospect of the various stages which led to the adoption of a certain plan, the innumerable ideas, sketches, suggestions thrown aside would be disheartening were it not for the feeling that at last a complete structure fulfilling certain definite needs is in sight.

Large bodies move slowly, and so with the association, and it was provident that no decided action was taken at an early date, for the unprecedented growth of the city and the great increase in membership were beyond the calculation of the first committee, and so while the project was under consideration and innumerable schemes developed, the needs and the ideals of the fraternity grew.

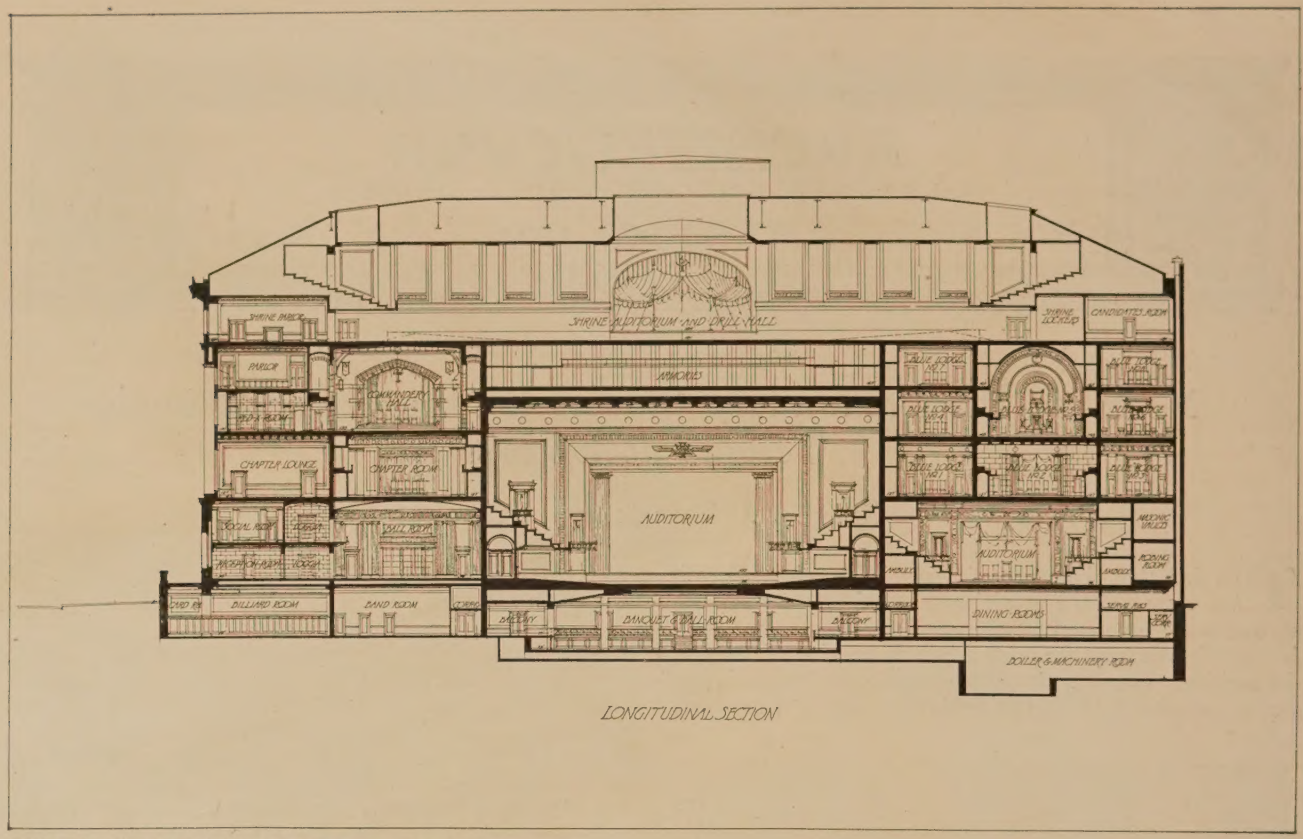
The original idea of the committee, as far back as 1915, was to purchase additional property adjoining the old structure, of which Mr. Mason was the architect. By rearrangements in the old building and the erection on the adjoining property of an auditorium with a seating capacity of 2,000, it was felt that the needs of the fraternity would be met for some years to come. It was planned to face the old building with marble, and the complete structure as a unit was quite successful from the standpoint of design, and provided in a smaller way most of the essentials incorporated in the final scheme.

This original scheme was abandoned and a new site purchased facing Cass Park, the plat being 200 by 350 feet. Later the association purchased an additional 50 feet, making a total frontage on Temple Avenue of 400 feet.

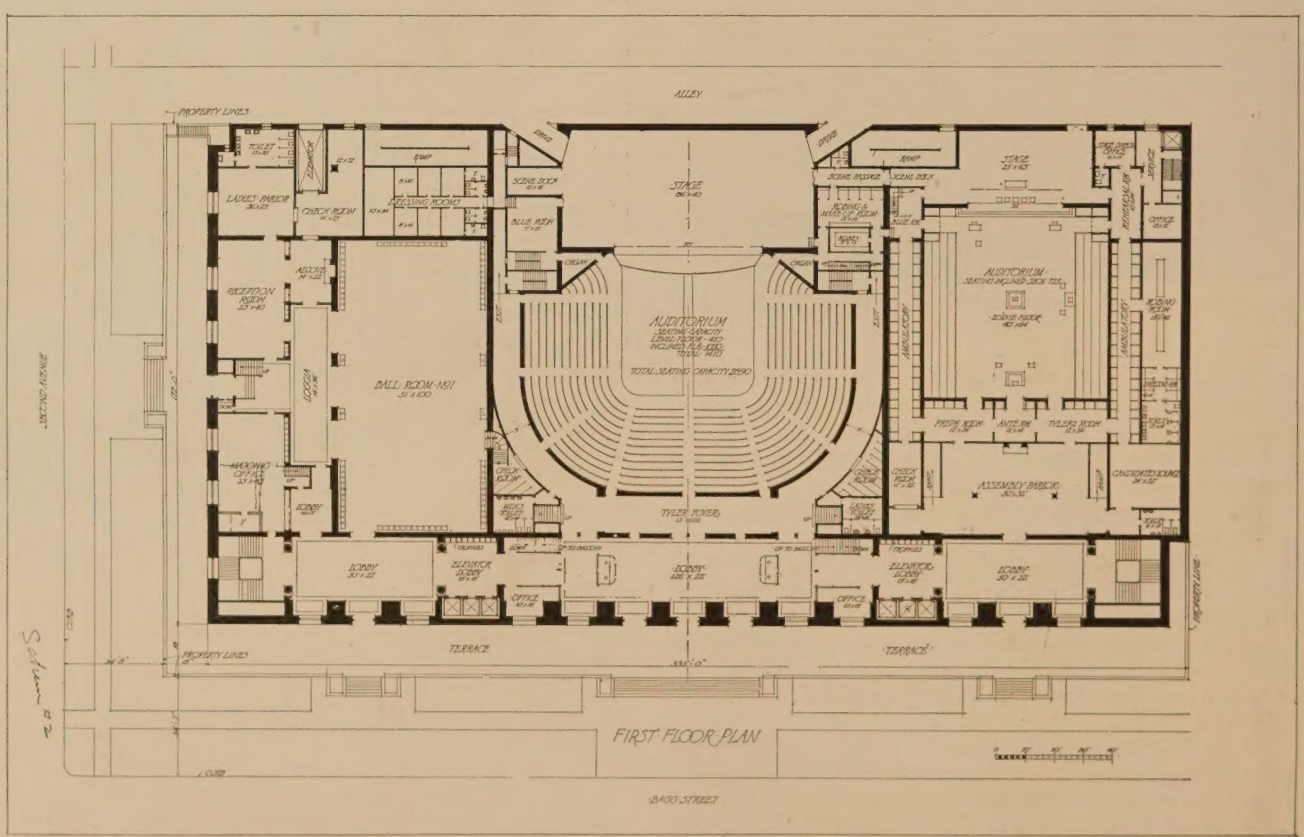
While the original scheme proved inadequate, it served to bring out the principal requirements and some original ideas in the planning of the various units. The planning of these units with their accessories and details is quite definitely laid down according to the ritual, but the arrangements desired have not always been met satisfactorily. These points were carefully studied at this time and various suggestions incorporated. The great departure in planning of one of these units was in the case of the so-called "Third Degree Blue Lodge." Due to the fact that the exemplifica-



End elevation for the first scheme proposed on the larger site.



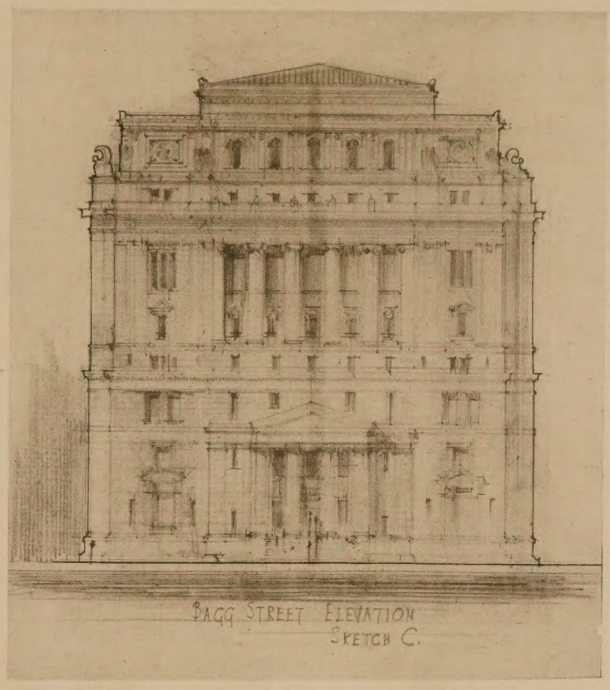

THE FIRST SCHEME PROPOSED ON THE NEW SITE.




THE FIRST SCHEME PROPOSED ON THE NEW SITE.

tion of this degree draws the largest attendance and for proper presentation requires some scenery, a parti was developed comprising three units: the seating space, the lodge proper with one side removed, and the stage—very similar in arrangement to some of the later moving-picture theatres.

One of the most important and certainly the most perplexing of the general problems presented, and which had its origin in the original scheme, was adequate provision for the growing need for club facilities and social functions. In the final scheme these have been provided for in every detail—a standard swimming-pool, 4 ballrooms, 24 billiard-tables, 8 bowling-alleys, library, also reception-rooms and parlors, for every division, also the very important banquet-rooms with a combined seating capacity of 4,700, with kitchen and serving-room area equal to that of some of the largest hotels. In addition to this, the Shrine end of the building houses a complete club with 100 individual sleeping-rooms and a large dormitory.



One of the preliminary sketches for the ritual portion of the final scheme.

It was thought that this site, 200 by 350 feet, would be ample for a monumental building expressing a single structure, and preliminary plans were worked out in detail. This was abandoned as the feeling grew that provision for the Shrine auditorium was inadequate. It was proposed in this scheme to resort to temporary seating on the drill-hall floor, which is the top floor of the building, and inasmuch as the Shrine ceremonials take place but four times during the year, it was felt that this arrangement might be practical. It was argued, however, that a large auditorium on the ground floor would serve other purposes and provide for the numerous benefit circuses, operas, and other entertainments put on by the Shrine and the Grotto, which are now given at the armory and at Orchestra Hall.

With this requirement in mind another scheme was developed by which the auditorium, seating 2,800, became a principal element of the plan with axis parallel to the main street, and demanded a tall building for the ritual portion of the building. Architecturally, this was ideal considering all the factors entering into the problem, but it was not developed in detail, for the reason that it was not possible to increase the seating capacity without the addition of a gallery to the auditorium. For ordinary conditions this could have been done, but in the work of the Shrine considerable of the main-floor space is occupied by an apron extension to the stage floor on which various drills, etc., are staged. To obtain a sight line from the gallery to this flat floor would increase the height of the auditorium to such an extent as to make impossible any effective architectural handling of the interior. At this time it became evident that the needs of the Shrine would require a seating capacity of 5,000, and the development of the final scheme accomplished this end and was adopted.

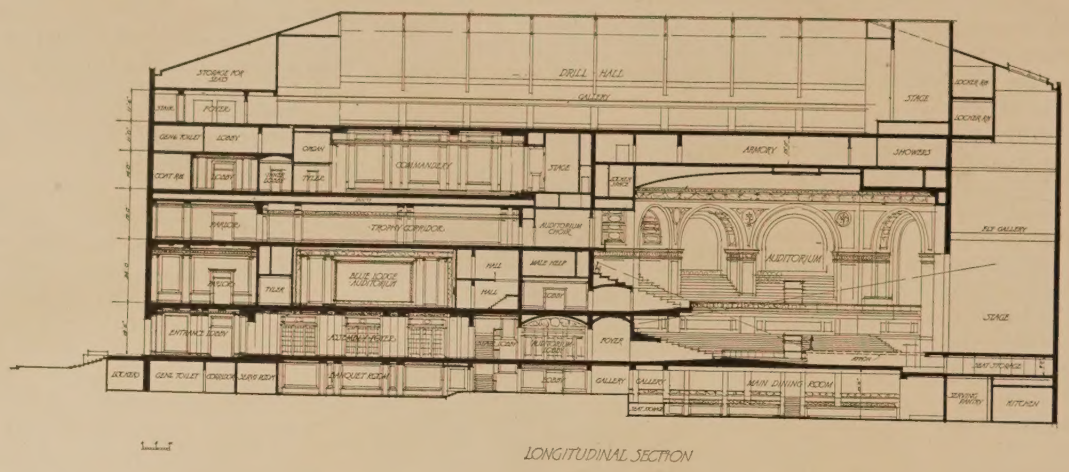
During this period of the study of the plan many minor arrangements were perfected and the character of the interiors determined upon. Among the more important and by far the most perplexing difficulty was the isolation of the Consistory portion of the building. It was required that the Consistory auditorium should be in the form of a nave with side-aisles and exterior lighting and a seating capacity of 1,700 with a large stage—to have its own separate entrance, lounge, parlors, and offices, and still have easy access to the rooms devoted to social functions. A reference to the plan will show that it was necessary to encroach upon the main auditorium with the stage of the Consistory, involving considerable complication, yet utilizing an area which would otherwise have been superfluous.

Up to this time the question of the power-plant had been held in abeyance, and was not considered in the preliminary studies, as the association owned a plot to the rear of the stage of the large auditorium, on which, in case it was necessary, the power-plant could be erected and something in the nature of a hotel would also be provided for. When the plans were fully under way, however, an additional 50 feet on Temple Avenue became available and the power-plant was definitely located on the rear end of this plat, the remainder to be devoted to an additional unit to be known as the Shrine Club, in which are housed the ordinary athletic-club features. Another complication occurred at this time, caused by the addition to the main building of two additional stories providing two large lodge-rooms and additional banquet-rooms seating 850. The requirements of the building code as to exits, stairways, seating, etc., were carefully considered, and with some minor changes all serious obstacles were avoided.

On June 17, 1920, the final preliminary drawings were approved and the architects ordered to proceed with the working drawings. The view-point of the Building Committee in regard to the plans together with a general description of the first-floor plan is embodied in the report of the chairman as follows:

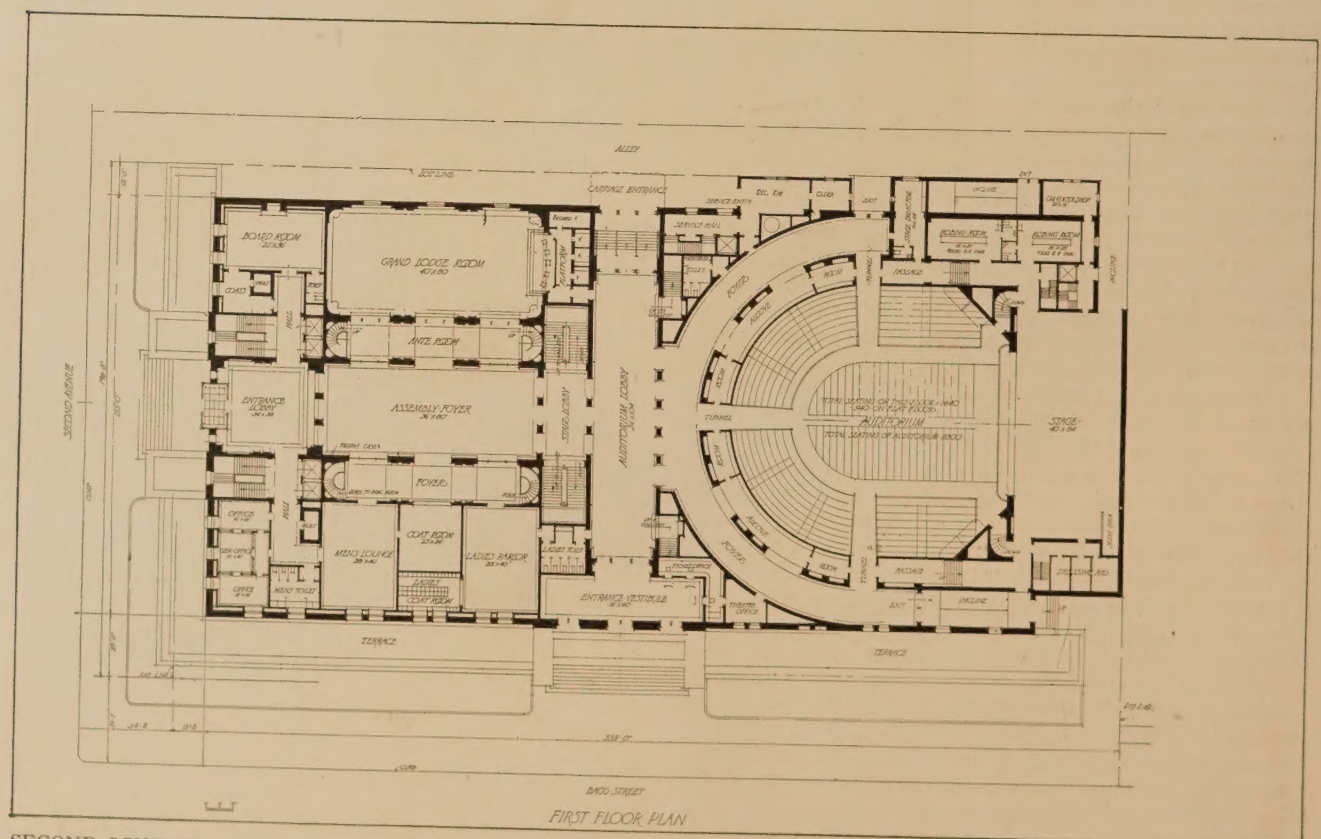
"It is the culmination of their efforts of the past three years and it is their hope that now they can present plans that will meet with the approval and requirements of every organization affiliated with the Masonic Temple Association.

"Many drawings were made to induce discussion and criticism in order that the specific needs of each body might be disclosed, considered, and provided for. The final selection and adoption of the various plans and ideas presented a wealth of material that had to be combined in one organic whole, and its subdivisions had to be so separated one from the other that coincident activities would not clash. This divisional feature was made to apply not only to the requirements of purely Masonic work but to club and social




LONGITUDINAL SECTION

SECOND SCHEME.




FIRST FLOOR PLAN

SECOND SCHEME.

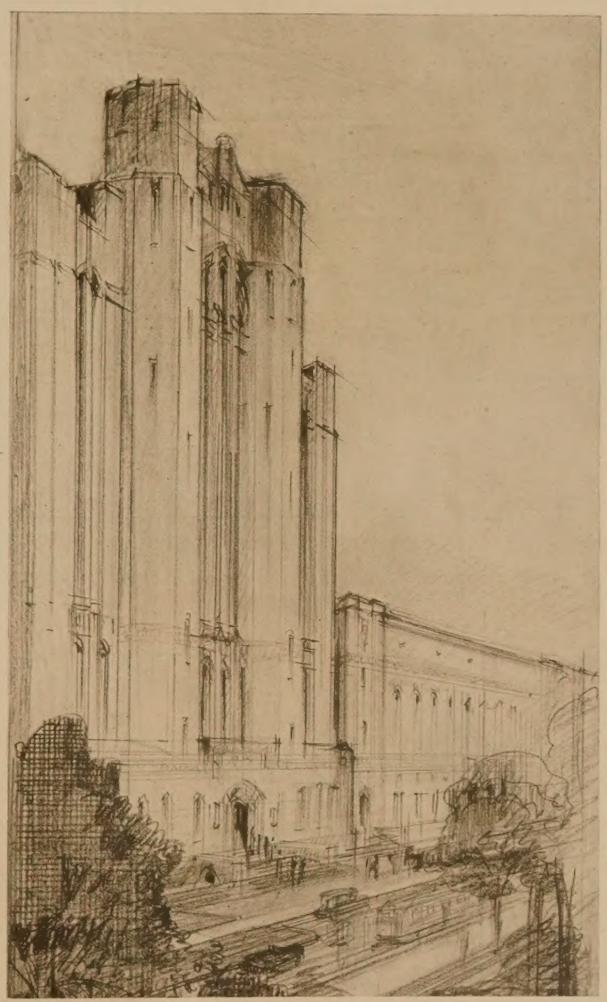
activities as well; one must not interfere with the other and yet both might be under full sway at one and the same time.

"It was also necessary to so co-relate the various divisions that free and easy access might be had from one to the other should their joint use be found necessary on special occasions.

"It has been the constant aim to so locate the various divisions that those which must necessarily accommodate large crowds be placed in the lower portions of the building. By this arrangement the number of elevators could be lessened as well as the cost of operating them, and proper provision made for social gatherings at any time without interference with Masonic work.

"The plans as now presented will be found to contain the number and size of rooms that will amply provide for the operations of all the bodies concerned, and although no attempt has been made to show all the minor details and fittings that will eventually be provided for the convenience and comfort of the workers, the number of cubic feet of space required for each body has been allotted, thereby allowing for slight modifications in details should same be thought advisable before final construction is begun.

"The reason for both the general and the particular arrangement of the first-floor plan was primarily to have three entrances—one for the Scottish Rite, one for the York Rite, and one for the auditorium, in order that each might control the entrance and exit to its own apartments, and so that each could carry on its work at any desired time without any possible interference with the other bodies.



First sketch made for a Gothic type structure, which was adopted.

"Bear in mind, however, that, notwithstanding the fact of the apparent isolation of each division, they are so closely related that convenient corridors of generous width afford easy communication from one to the other.

"The portion devoted to the Consistory is two stories in height, fronts on Second Avenue and extends east about 150 feet, affording ample length for a cathedral suitable for the work and seating about 1,500. A part of this space is also planned for a fully equipped stage 32 by 54 feet, with large property and robing rooms, located on the stage level and also on a mezzanine directly overhead.

"Upon the right, entering the Consistory from Second Avenue, are the offices, and to the left the lounging-room and parlor. Back of the lounging-room are the coat and toilet rooms and the corridor leading to the auditorium.

"From the lounging-room stairways lead to the banquet-room in the basement and up to the Candidates' Room and Board Offices on the second floor.

"The west entrance on Temple Avenue opens into a lobby 23 feet by 60 feet, affording access to six passenger-elevators and two large stairways leading to the rooms of the York Rite bodies on the floors above.

"At the east end of this lobby are the business offices of the York Rite bodies, Shrine and Grotto, provided with vaults and other necessary modern office equipment.

"The easterly half of this floor, covering a space approximately 168 feet by 200 feet, is allotted to the auditorium. The main entrances and foyer open out to Temple Avenue, and parlors and coat-rooms that properly belong with such an auditorium extend along to the main south front.

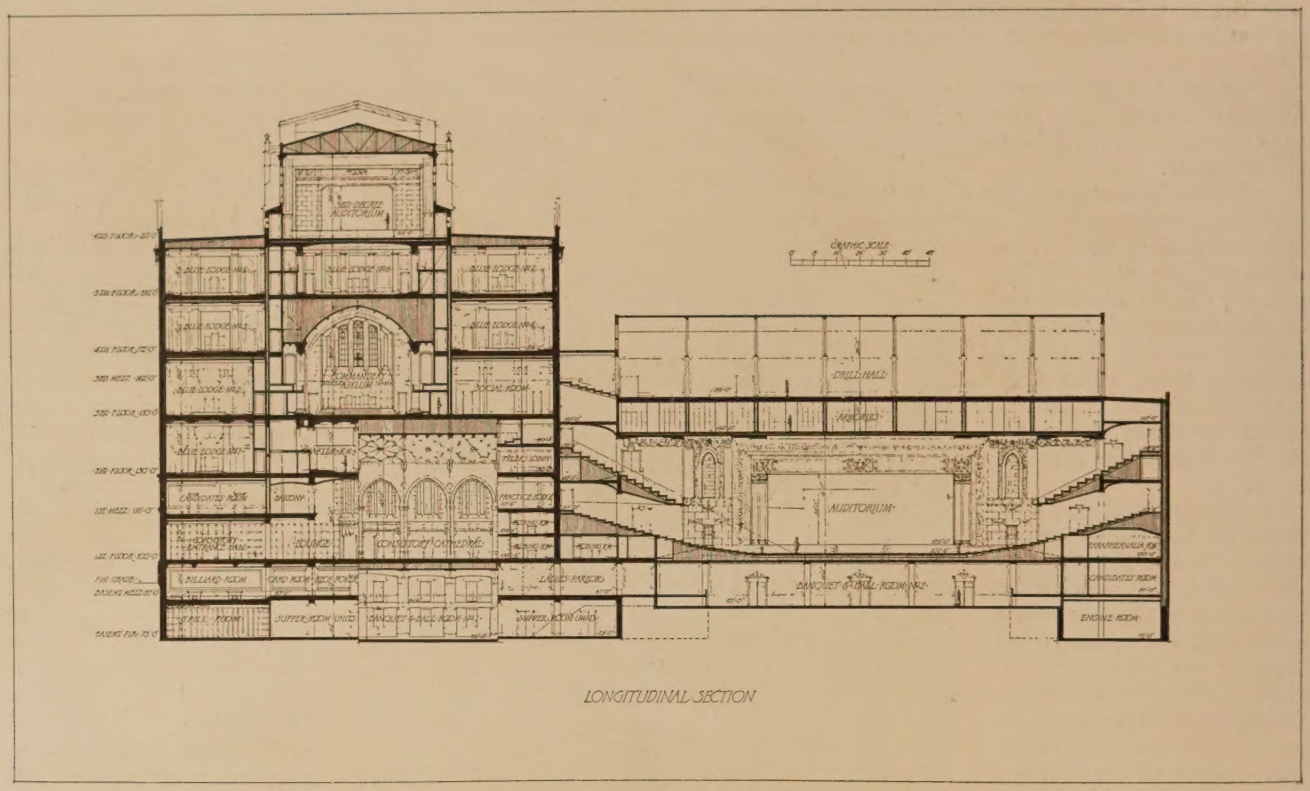
"The north side of this section is given over to the stage and dressing-rooms. This stage is 50 feet by 95 feet with a curtain opening 64 feet wide. Seating capacity of the auditorium is 5,000, all seats being located on the first floor and balcony. Ample exits are also provided at the rear, one of which is through a large lobby where motor-cars can load under cover.

"While it is true that the cost of the building according to the plans as adopted was based substantially at 25 cents a cubic foot, we are now confronted with a cost of approximately 45 cents. For this increase the board is in no wise responsible, and it is due entirely to economic conditions. Still, I think the increase can and will be met promptly by the fraternity when once given the opportunity.

"Some of our influential and active workers are of the opinion that we should segregate the Masonic section of the proposed building from the auditorium occupied by the Shrine and Grotto, making each a separate building, acting independently and under separate management. While I yield to the force of their logic and readily admit of its soundness for many reasons, still the advantages accrued by uniting the two units are apparent. There are many utilities that must be provided to accommodate the craft that are interlocking, and no one building is of sufficient proportions to furnish them.

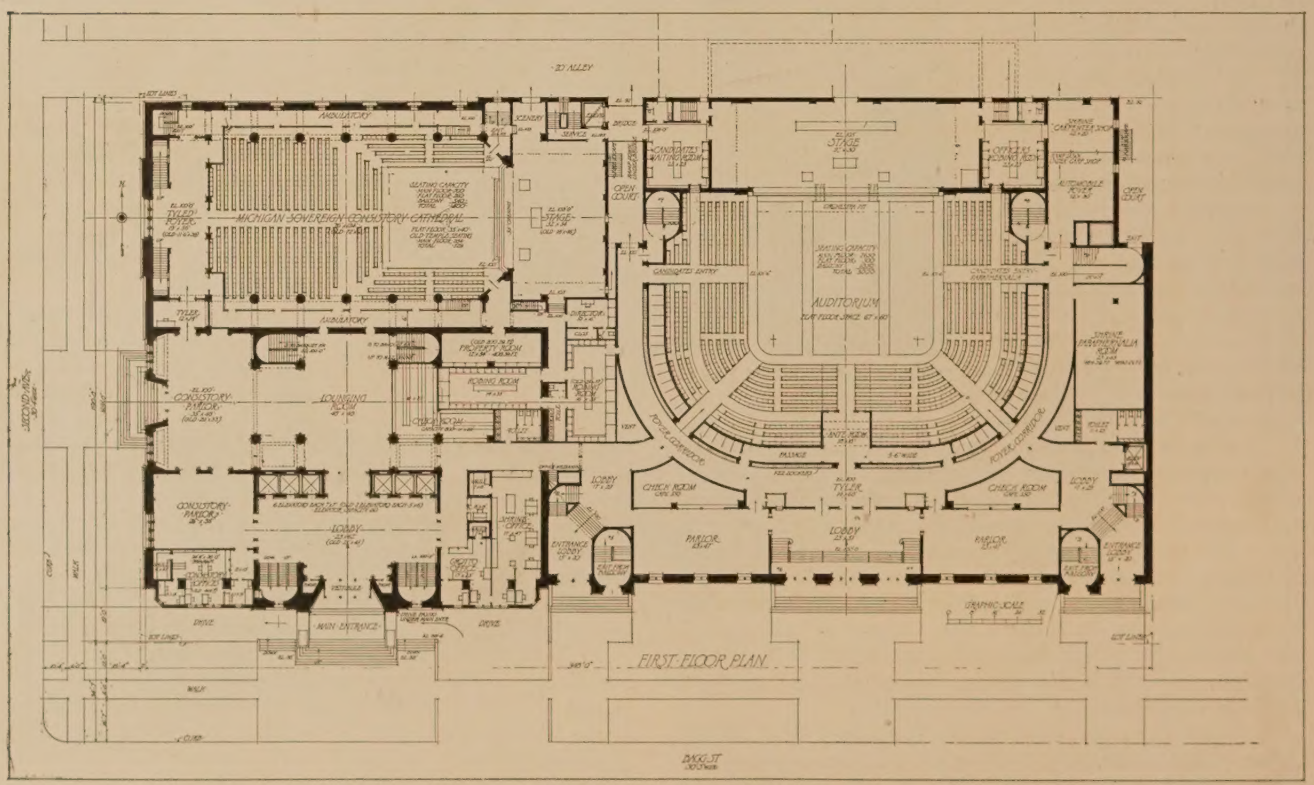
"Take, for instance, the banquet facilities. Collectively our plans provide for the accommodation of 4,700. A part of this space is convertible into a ballroom, the remainder of the basement set aside for social and club features. The accommodations as planned could by no process of reasoning be crowded into one building or subdivided by a brick wall.

"The same condition confronts us relative to the location assigned for the 5,280 lockers, shower-baths, swimming-



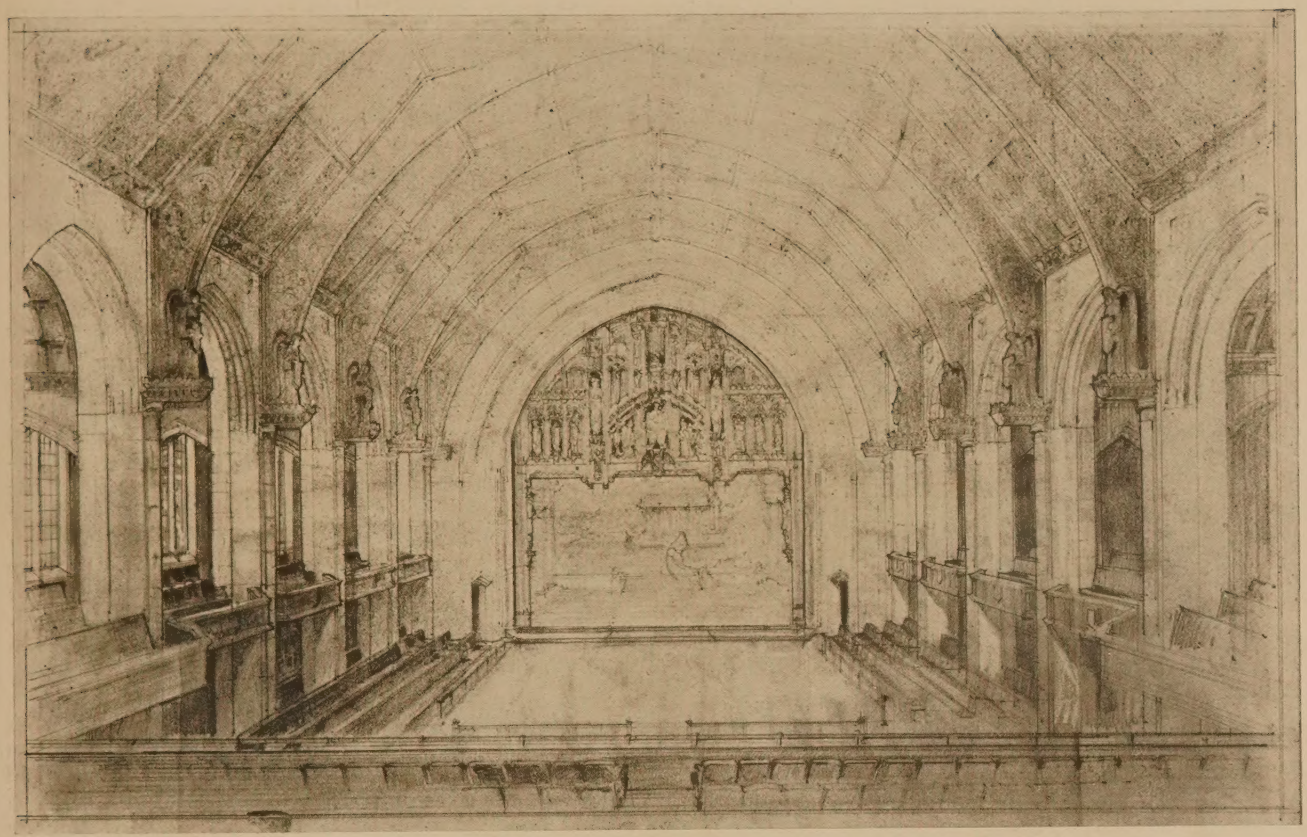

FINAL SCHEME AS ADOPTED IN THE PRELIMINARY STAGE.

This does not show the two additional stories which were added to the Ritual Building, making a total height of 208 feet for this portion of the building.

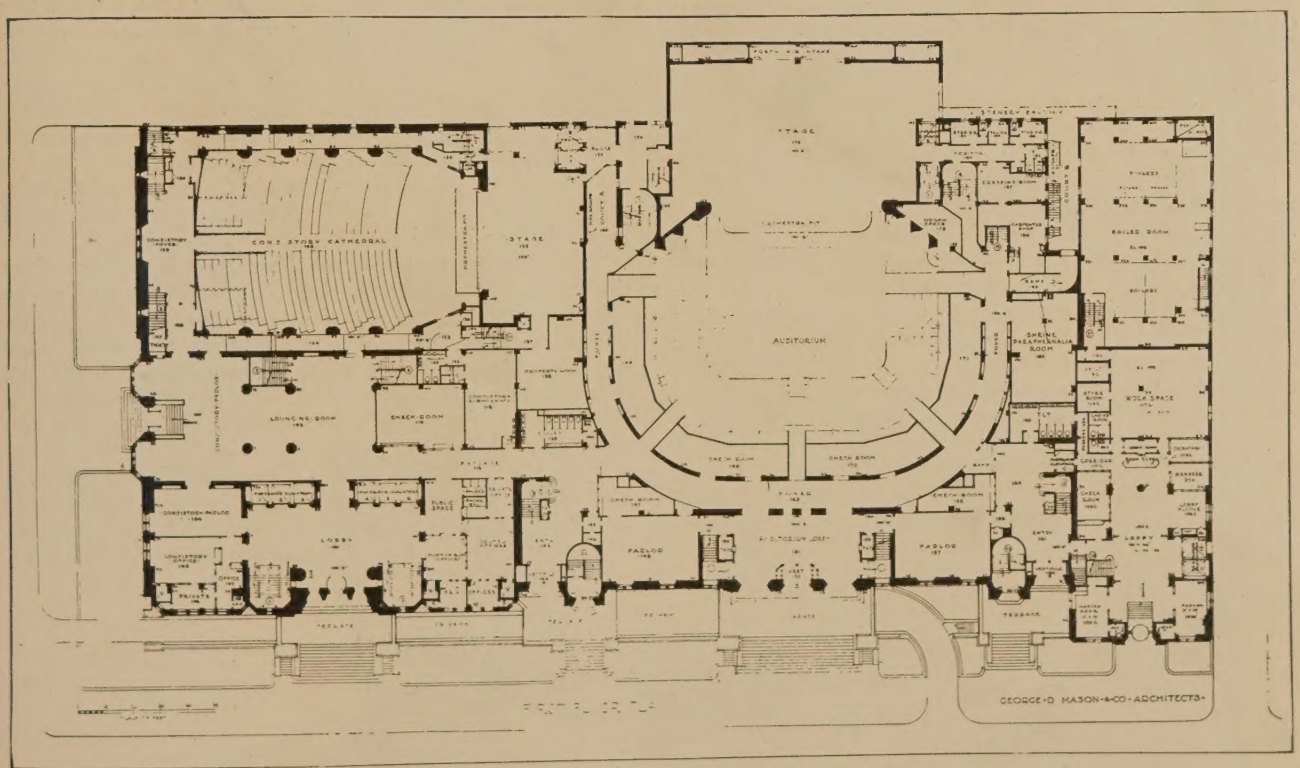



FINAL SCHEME AS ADOPTED IN THE PRELIMINARY STAGE.

This does not show the additional 50 feet on which the Shrine Club has been planned.



ONE OF THE PRELIMINARY SKETCHES FOR THE CONSISTORY CATHEDRAL.




FIRST-FLOOR PLAN AS FINALLY DEVELOPED.

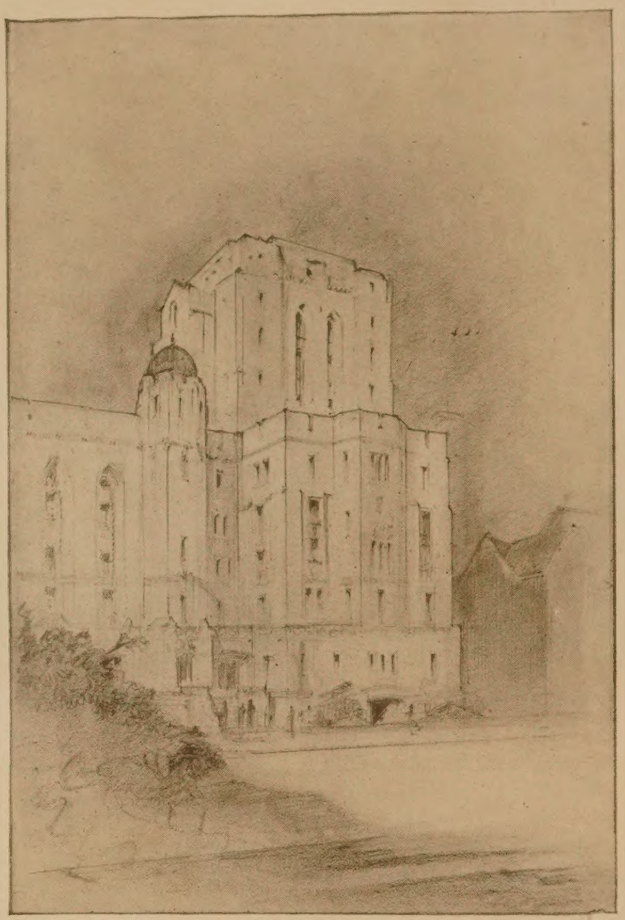
Showing Shrine Club and power-house, the larger stage in the Shrine Auditorium, and the extension of the driveway.

pool, and drill hall, which are over the auditorium and in direct communication with the Masonic unit.

"It must be obvious to all that in order to make these necessary utilities function perfectly and supply the needs of our great membership, we will be compelled to use both units, one in conjunction with the other.

"Another advantage is that we would avoid duplication in many things that enter into maintenance cost, which is of itself vital."

"Quite early in the consideration of the exterior a decided preference for the Gothic was evident and was expressed both by the committee and the general public. Yet, the architects having in mind the beautiful refinement of the Temple at Washington made numerous studies along classic lines but ultimately selected the Gothic as the conviction grew upon them that it best expressed the general sentiment and tradition of Masonry in its active form, Solomon's Temple and that at Washington to the contrary notwithstanding. The spirit and tradition of the Knight Templars was unquestionably Romanesque or Gothic, and operative Masonry having its origin in the guilds in Europe had the tradition of the great cathedrals of which they were the builders."



Sketch showing the Shrine Club addition.

The hard and fast demands of the plan prevented any great freedom in the handling of masses. Yet it was felt that the sky-line and the bold reveals would give the structure the proper character. While the splayed reveals measuring 30 inches in depth seemed at first excessive, an examination of the working drawings at this time shows the furred spaces, necessitated by these reveals, in some cases completely filled with ducts, in others utilized as closet spaces, recesses for lockers, small stairways, etc.

The additional 50 feet which was added later and which provides for the Shrine Club was a fortunate acquisition, from the standpoint of design, as it provided a termination to the auditorium unit which has a somewhat horizontal effect.

As finally designed, there are three units fronting on Temple Avenue—the Ritual Building, 208 feet high, the Shrine auditorium, 100 feet high, the Shrine Club, 145 feet high. While from the natural restrictions of the site it will be impossible to view these buildings as a unit, the sky-line of these varying heights should be interesting and impressive.

As the plans developed in detail the flexibility of the Gothic style showed itself in several features which add to the interest and give character to the structure. For example, the requirement of additional space on the first floor of the Ritual Building was met by projecting bays at either side of the octagonal towers, and in the case of the Shrine auditorium it was found necessary to eliminate the stairs from the seating and circulation area. This was done by the addition of the towers which terminate the façade of the unit. In general, there has been no straining for effect nor masking of difficulties in either façade, as would have been inevitable in either the classic or Renaissance styles.

Some time before the working drawings were finally settled upon, a $\frac{3}{16}$-inch-scale model of the group was prepared and exhibited. Several minor changes were made, but in the main the design seemed satisfactory. This model has been useful as a reference in the detailing of the stone-work.

It would appear then from this general description of the difficulties of an unusual problem that a definite programme was not evolved until definite action became imperative. There was no precedent or anything in any way similar, and as the plan is unusual, so is the steel structure of 8,000 tons with its variety of spans and heavy girder construction; the heating and ventilating with unusually intricate duct systems; the lighting and power with a load of 1,000 kilowatt; and the use of a great number of unusual lighting effects in the various lodge-rooms and auditoriums. Provision has also been made for over 400 telephones and 75 electric clocks, and it has also been planned to floodlight the entire building.

HOUSE, J. F. SCHWARZENBACH, HICKSVILLE, LONG ISLAND, N. Y. (ALTERATION).

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# Editorial and Other Comment

## *The Influence of Two Famous Firms on Our Architectural History*

WE are all interested in the how and why of individual achievement, and to-day we are deluged with the personal histories of the wise and aspiring, the thrifty and the lucky, not to say the unscrupulous, who have turned two dollars and fifty cents into two million. Most of these human-interest stories deal with successful men, men who have got there, estimated in the coin of the land. They are dollar-marks on the great road of human progress.

We are not envious of these fine fellows, for many of them are "the salt of the earth" and go about doing good, spreading the gospel of industry, opportunity, thrift—and shrewdness.

There is a lot of success that would never have been recorded but for the happy chance of suitable environment, for we are all dependent to a large degree upon our associates, and in no profession does this more signify than in the profession of architecture.

How true this is was made very clear in Mr. Donn Barber's recent letter to the New York *Herald*, and the facts are so interesting that we feel like passing them on to our readers who may not have seen them. And we especially like to do this because the kind of success referred to means something beyond the mere accumulation of money. These men have left and are leaving their impress upon our national art.

The offices of all of our architects are the training-schools for the leading architects of the future. Hundreds of young men have found and are finding inspiration and encouragement in beginning their careers in the offices of the older men.

Mr. Barber's letter was prompted by the recent giving of the medal of the Royal Institute of British Architects to Mr. Thomas Hastings.

As he well says, a most important part of our architectural history will be founded on the records of the two great firms he refers to—McKim, Mead & White and Carrère & Hastings.

"In looking over the list of successful and prominent firms it is surprising to find how many men composing them began their apprenticeship and received their earlier inspiration and training in the offices cited. These were the offices of McKim, Mead & White and Carrère & Hastings. Both Mr. Carrère and Mr. Hastings after they had finished their studies in Paris were members of the staff of McKim, Mead & White before starting in business on their own account.

"It is unnecessary here to go into the interesting history of these two great firms other than to state generally that McKim, Mead & White have followed the influence of Italian design, and that Carrère & Hastings have followed the influence of French design as taught by the École des Beaux Arts. The students of both offices have quite naturally reflected their training in their personal work, but to-day we find the two earlier distinct foreign influences merged in such a way that a newer style has resulted that is being created of a distinctly American character.

"When our history of architecture comes to be written the far-reaching effect of the work of the two older firms on the development of our architectural expression must be fully recognized.

"The following are a few of the well-known architects who were brought up in the office of McKim, Mead & White: John M. Carrère, Thomas Hastings, Edward P. York, Philip Sawyer, Lewis Colt Albro, Harrie C. Lindeberg, Evarts Tracy, Egerton Swartwout, Cass Gilbert, Henry Bacon, William A. Boring, Edward L. Tilton, John Mead Howells, H. Van Buren Magonigle.

"The following were connected with the early staff of Carrère & Hastings: William Adams Delano, Chester H. Aldrich, William Welles Bosworth, Donn Barber, Benjamin Wistar Morris, Henry F. Hornbostel, Electus D. Litchfield, Charles Ewing, John Van Pelt, Nathan C. Wyeth, John W. Ingle, C. W. Stoughton, Charles Butler, F. B. Hoffman, Jr.

"This newer generation of offices are in turn giving of their best to their younger men, first as apprentices, then as equals, and finally as successors—so are principles handed down unbroken.

"Some years ago the medal of the Royal Institute of British Architects was awarded to Charles Follen McKim, so that now it seems only proper and fitting that it should be awarded to one of his most distinguished pupils."

## *From Coast to Coast*

IN these busy days it is very pleasant for an editor to receive a letter now and then, some word of interest and appreciation, or even friendly criticism. If his subscription list keeps up to standard and the business pages show a healthy growth, no doubt he should be content and let well enough alone. But we all have a personal interest and pride in our work if we are worth our salt, and a bit of encouragement, a good suggestion comes in mighty handy.

We are indebted to Mr. Willis Polk, of San Francisco, for a letter suggested by our editorial "In Behalf of Art," comment on the fine work Dr. C. Howard Walker is doing in this direction. Mr. Polk suggests our advocating a "course in art as a part of the curriculum of all educational institutions," theological schools included. "The glory of the mediæval cathedrals and the bewildering charm of the Renaissance were mostly due to the patronage of the church. To the shame of the church of to-day (all denominations) art finds its feeblest expression in modern church buildings."

We wish any word we might say could help even a little bit in the campaign for a more general appreciation of the value of a study of art in our schools. Mr. Polk may be assured that we are with him and with all who believe that even in these days of science, materialism, and grab the humanities are yet an essential element in any well-rounded education.

There is a very large element in our population that seems to think that almost any interest in the arts means a loss of aggressiveness, a weakening of the power "to get there," but Colonel Roosevelt had a very keen appreciation of art and did much in its behalf.

The trouble is that art is too often confused with a meaningless pose or vapid sentiment; in its sincerest manifestations it never lacks vigor, purpose, and great determination.

### *Too Much "Bunkum"*

WE have been reading a little book made up of addresses and articles by W. R. Lethaby, of London, an architect and a scholarly writer on the subject. The title "Form in Civilization" doesn't sound attractive or suggest anything better than a rather dry and professional preachment. But there is meat here for strong men, for honestly thinking men, for men who have grown tired of cant in talking about architecture and art.

"It is just because I want a true artistic or human-nature content given to our buildings that I would sweep away the teaching of grandiose bunkum as architectural style. Although a good bunkum may be jolly sometimes, I want a due proportion of tenderness, gravity, sweetness, and even dulness. I want the most exquisite beauty, but I do not see how this Institute is to teach how to produce it. Therefore I say train us to practical power, make us great builders and adventurous experimenters, then each of us can supply his own poetry to taste. In fact, looking at Holborn and the Strand as they are, I venture to say it would be a sort of poetry to get rid of sham poetry. One of the most sad wastes of power to which men of good-will are subject is vain strife about words, especially when pairs of words have been allowed to come into opposition—as faith and works, art and science. There is really no opposition between art and science. Show me your art, as St. James might have said, and I will show you your science. Art is the active side of things, science the contemplative. The most of art is science in operation, and a large part of science is reflection upon art. Properly, only science can be taught, for you cannot teach beyond knowledge, and every fresh activity is a sort of creation. This is art—the works whereby we show our science. It is our false idea that art is a sort of ghost which frightens us off true work. It is just this talk about the styles which leads to—Holborn. I know as well as anybody that conception, style, design are essential requirements in all that men do, from guiding the state to laying out a railway or preaching a sermon, but they cannot be supplied by Act of Parliament or by this Institute. While we have been having these meetings another conference was held, the members of which were eager to assure Mr. Neville Chamberlain that architects were not to be thought of as hairdressers in the styles but as men of power as practical builders. Individuals, unfortunately, may make their way by claiming to be the priests of mystery architecture and talking tall art to Mrs. Jones, but to do so is a grave injury to the whole body, which must stand on reasonable service. It has, in fact, betrayed us to the caricature of Pecksniff. Modern architects have to deal with very complex and technical matters, the building on congested sites of great hotels, railway stations, factories, business premises, and the like, and for this it is clear to me there must be highly organized scientific training. What are the main divisions into which different faculties might run? There seem to me to be about five: (1) the expert constructor and planner, (2) the finisher and furnisher, (3) the expert in old buildings, (4) the man of business, (5) the country builder and general practitioner. There is no sharp distinction, but I think most men gravitate to one or other of these classes or to a combination of two or even three of them, and there is room for high attainment in any one. The first and the last should be the main concern of this Institute. Probably the standard for a time should be that of the general practitioner, but ways must be found to stimulate specialization beyond the minimum course—a point to which I shall return in touching on education."

### *A Great Loss to the Profession*

WE have received the following notice of the death of Mr. William A. Bates, of the firm of Bates & How, and join in the most sincere regret at the loss of so good and able a man. He was an honor to the profession of which he was a distinguished member and his work will be remembered and valued.

With deepest sorrow we announce the death of our senior partner, Mr. William A. Bates, on Thursday, July 27, 1922. The business will be continued by the surviving partner under the same name as heretofore.

BATES & HOW.

Kenneth G. How.

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## Correct Piling of Lumber

The simple expedient of correct piling of oak will prevent a very expensive source of waste to chair manufacturers, according to the Forest Products Laboratory. Season checks particularly to plain sawed oak have caused great loss, one chair manufacturer stating that fifty per cent of his cabinet repair costs are due to season checks. This loss has often been regarded by the practical lumberman as a necessary evil, but the Forest Products Laboratory contends that these wasteful and costly checks can be prevented during yard seasoning by correct piling, and it is proving this contention by experiments.

The primary cause of the trouble is that the plain-sawed surfaces of the stock are left exposed to the drying action of the sun and winds; the surfaces tend to shrink as they dry, but the interior of the stock, which is not drying so rapidly, resists the shrinkage on the surface, and the result is a surface check or crack.

Proper piling will reduce and control the rate of drying from the plain-sawed surfaces. If the quarter-sawed surfaces, which do not appreciably check even under severe drying conditions, are on the top and bottom, next to the supports, and the plain-sawed, or sides of the pieces, are brought closely together within, the drying will be controlled and the surface checking prevented.

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## Timber Preservation

The most notable progress recorded in the pressure treatment of timber to prevent decay was recently made, according to a report issued by the service bureau of the American Wood-Preservers' Association.

The report states that the 112 active pressure wood-preserving plants scattered throughout the country used in 1920 50,000,000 pounds of zinc chloride and 69,000,000 gallons of creosote-oil for the treatment of over 2,000,000,000 board feet of timber.

The treated material consisted mainly of railway-ties, construction timbers for wharf, bridge, highway, mining, and building purposes, piling, telephone and power poles, fence-posts, wood blocks for street-paving and for factory floors, and lumber for miscellaneous uses.

Decay, which can be prevented by proper preservative treatment, destroys more wood annually than any other agent. The desire for permanence at low cost is given as the reason for the increased demand for well-treated timber.

WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.

LOBBY.

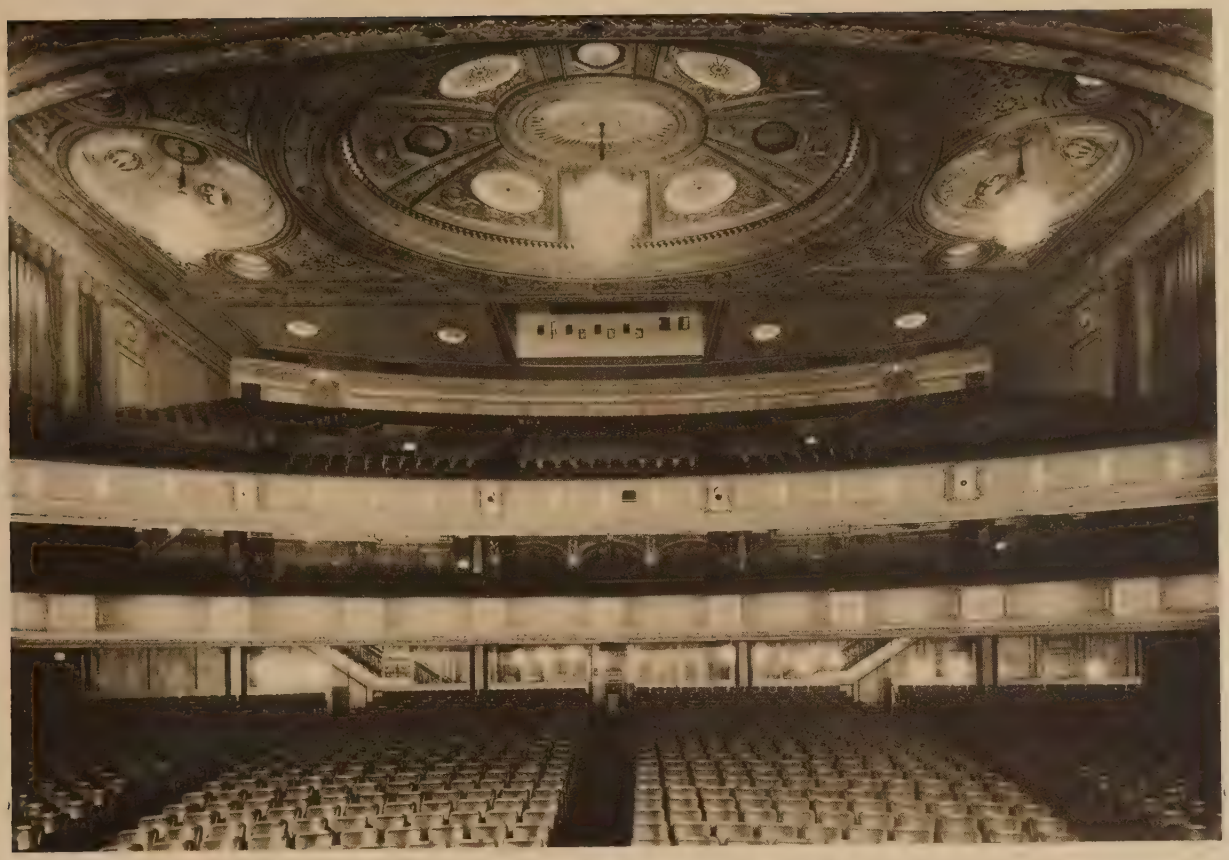
PROMENADE (AUDITORIUM).

PROMENADE (MEZZANINE).

LOUNGE.

WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.

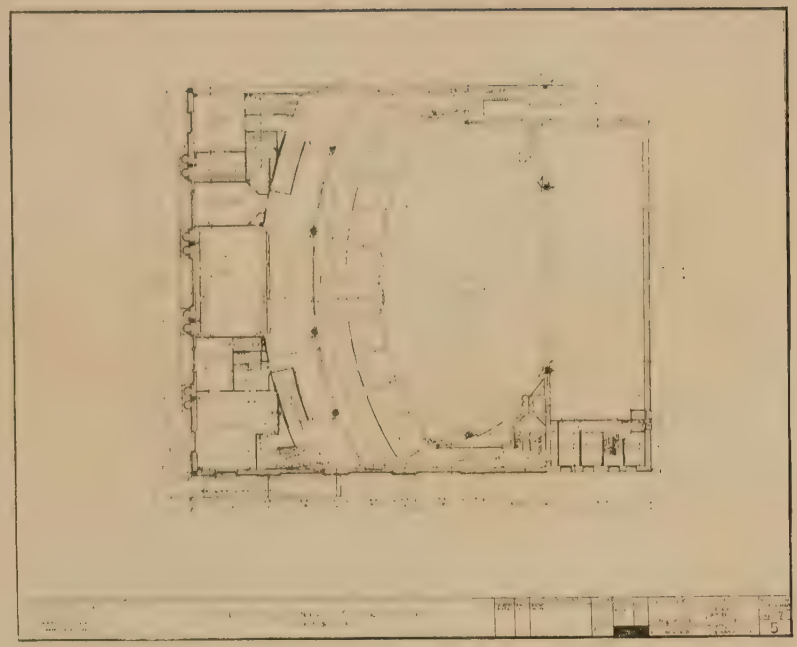


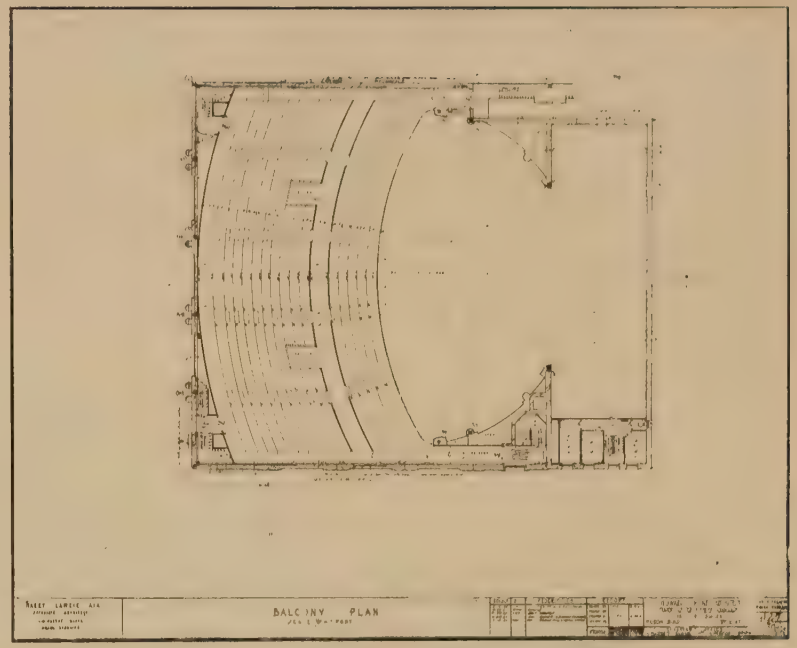
AUDITORIUM.

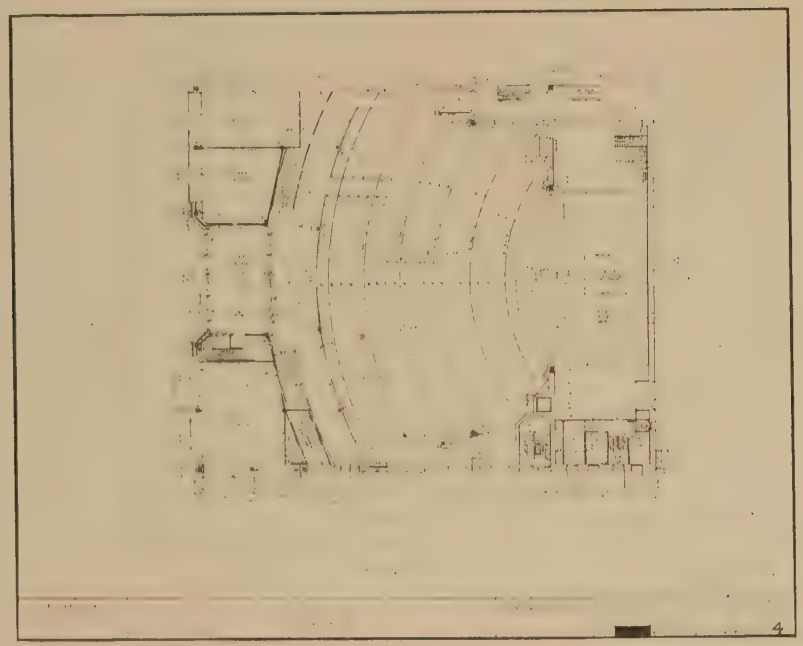
STAGE.

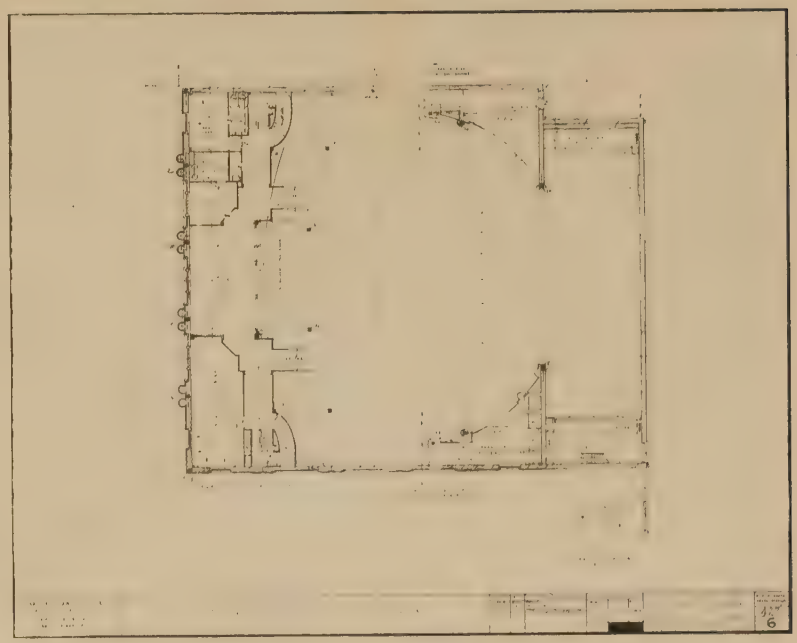
WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.







PLANS, WORLD THEATRE, OMAHA, NEB.

C. Howard Crane, Architect. Elmer George Kiehler, Cyril E. Schley, Associates.


STATE THEATRE, MIDDLETOWN, N. Y.

Eugene De Rosa, Robert R. Graham, Associated Architects.


PROMENADE.

DETAIL OF BOX.

STATE THEATRE, MIDDLETOWN, N. Y.

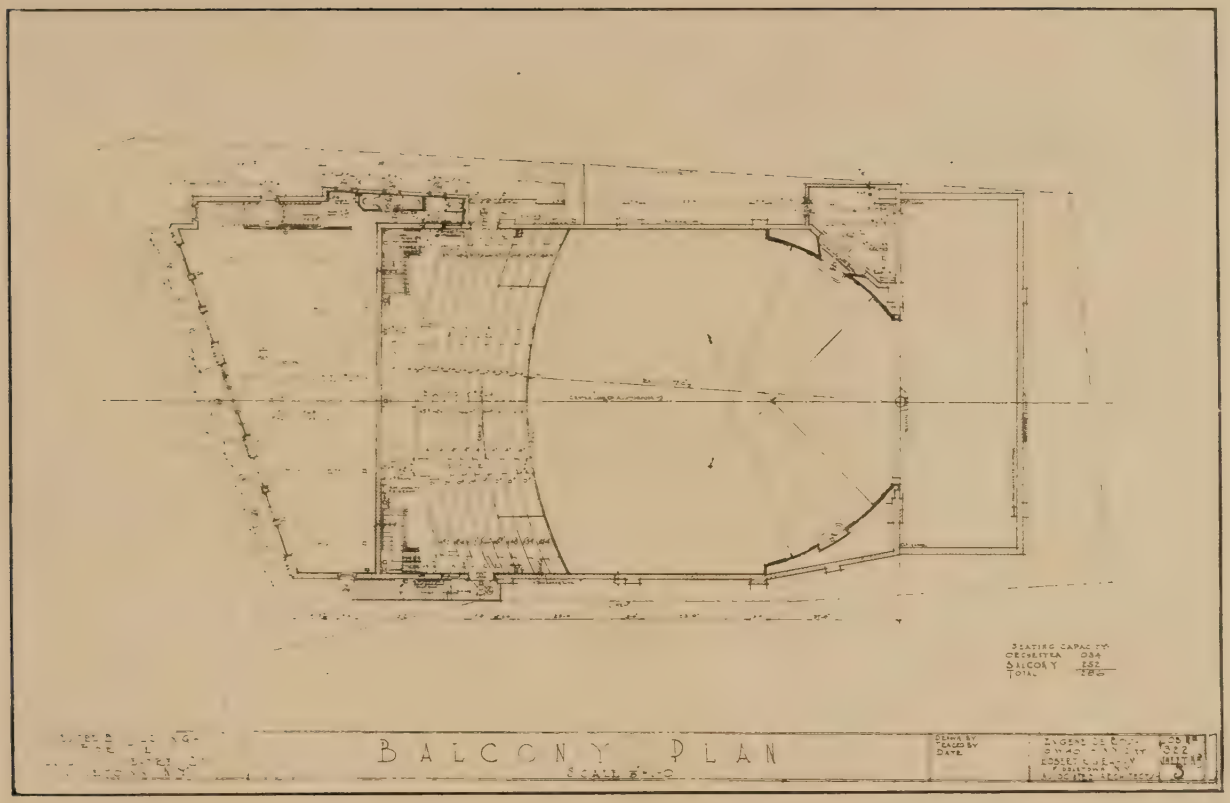
Eugene De Rosa, Robert R. Graham, Associated Architects.

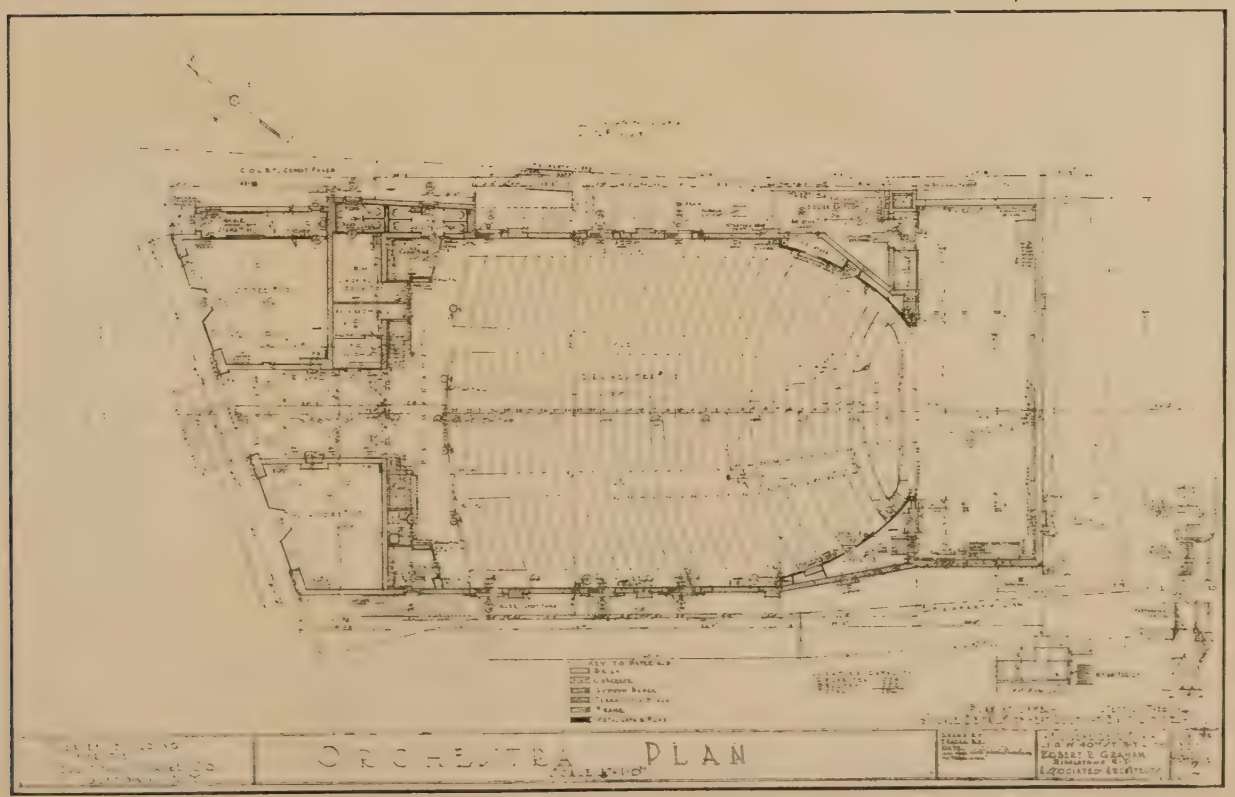
AUDITORIUM (TOWARD STAGE).

AUDITORIUM (TOWARD BALCONY).

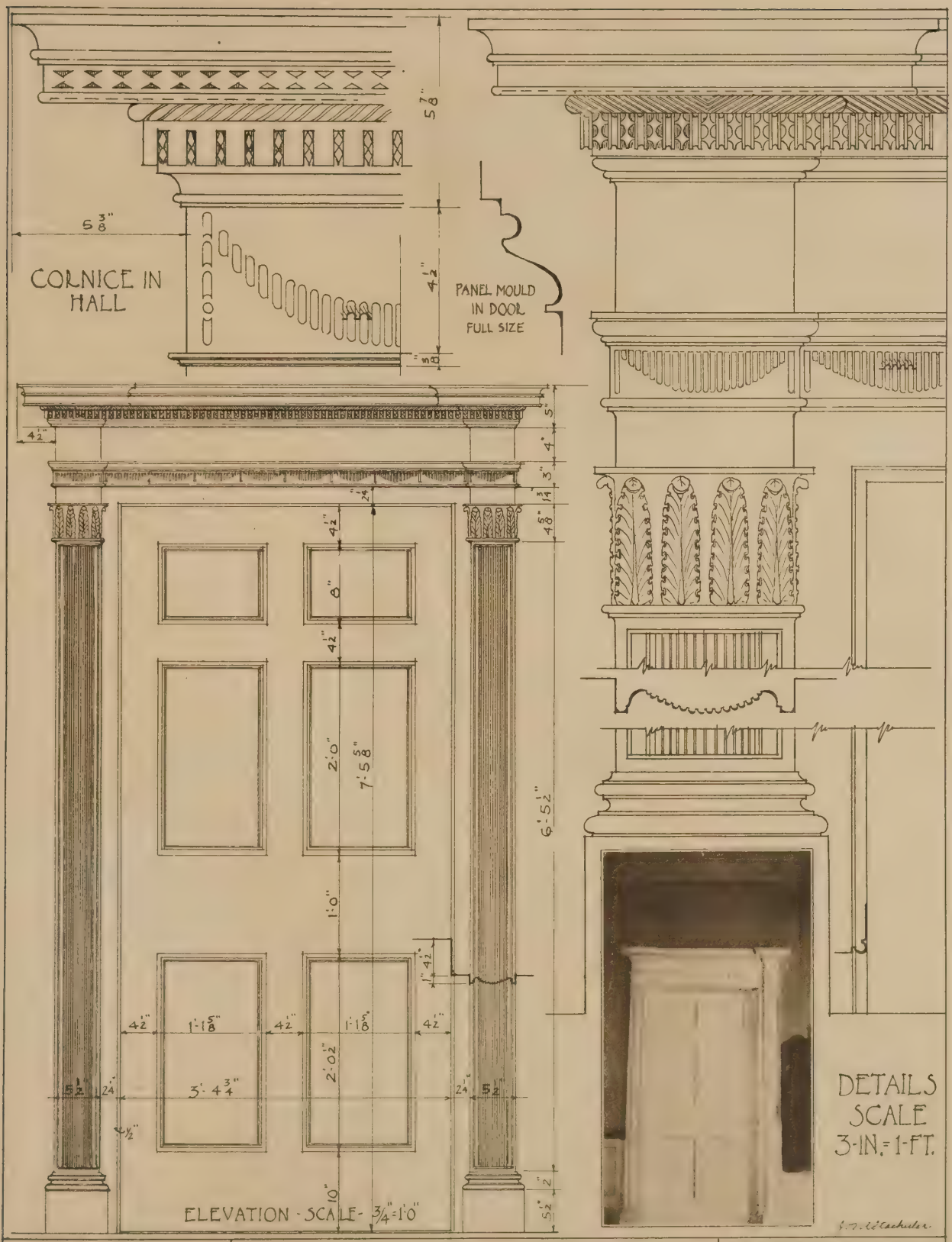
Eugene De Rosa, Robert R. Graham, Associated Architects.

STATE THEATRE, MIDDLETOWN, N. Y.




STATE THEATRE, MIDDLETOWN, N. Y. Eugene De Rosa, Robert R. Graham, Associated Architects.




| COLONIAL ARCHITECTURE of the CAROLINAS | INTERIOR DOOR & CORNICE 113-ASHLEY AVE. DATE ABOUT 1810 CHARLESTON-S.C. | MEASURED & DRAWN by J.A. ALTSCHULER |
|---|---|---|


BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.

John H. Phillips, Architect.

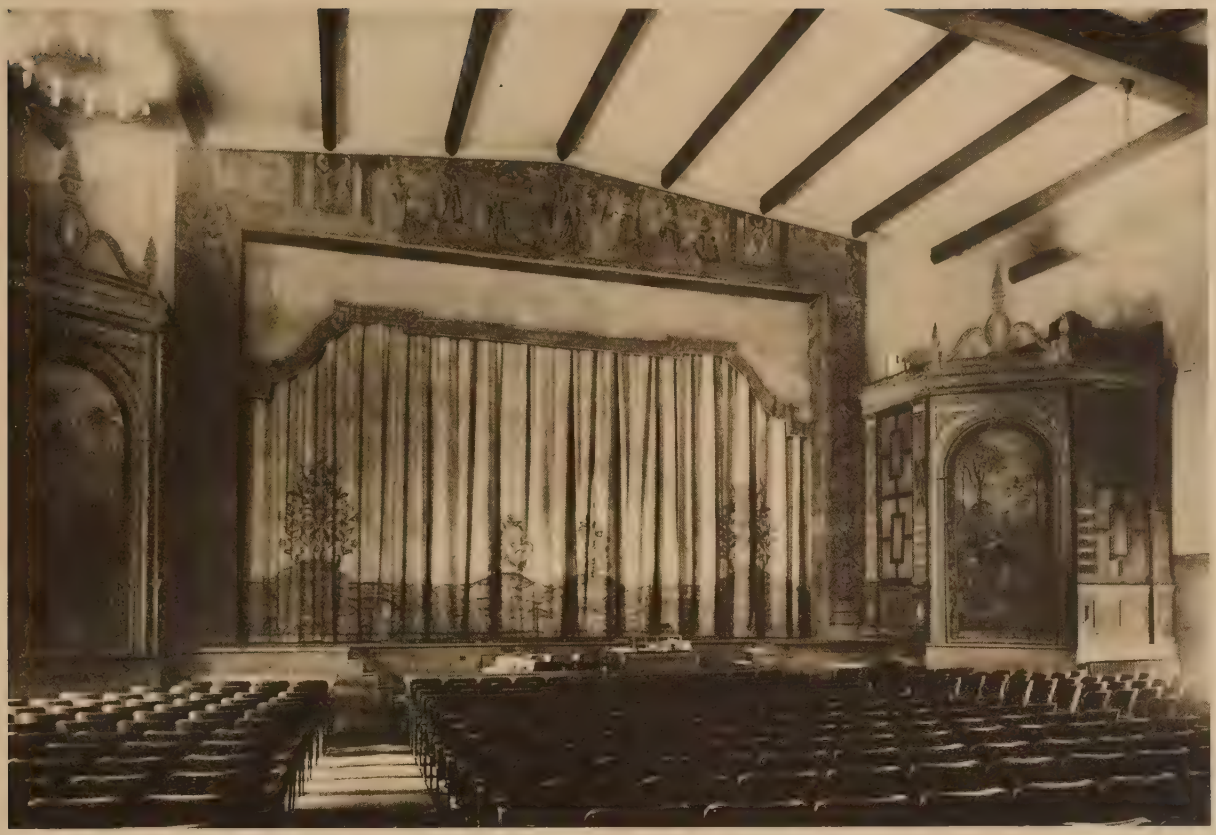
LOUNGE.

LOBBY.

FOYER.

John H. Phillips, Architect.

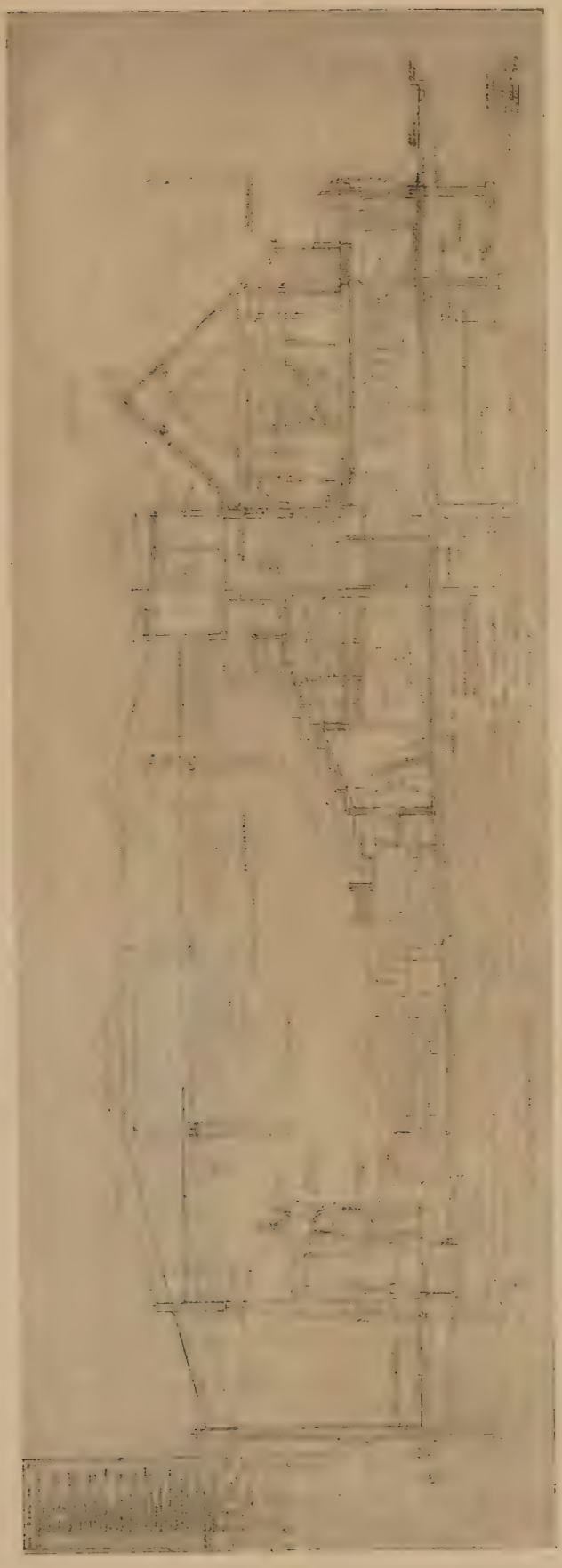
BELLEVUE THEATRE, UPPER MONTCLAIR, N. J



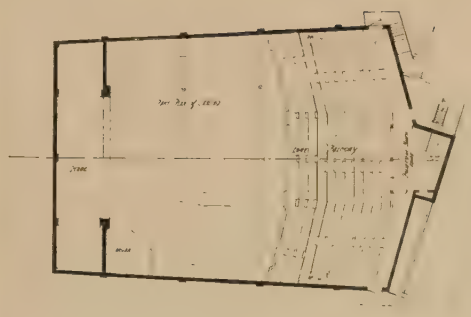
AUDITORIUM (TOWARD STAGE).

AUDITORIUM (TOWARD BALCONY). John H. Phillips, Architect.

BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.



LONGITUDINAL SECTION.



PLAN BALCONY.

PLAN MEZZANINE.

PLAN MAIN FLOOR.

BELLEVUE THEATRE, UPPER MONTCLAIR, N. J.

John H. Phillips, Architect.

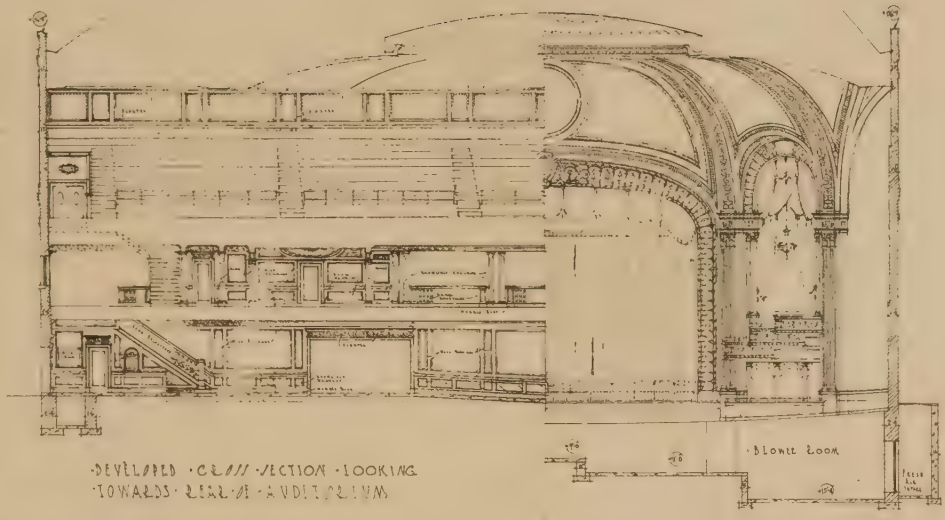

EXTERIOR.

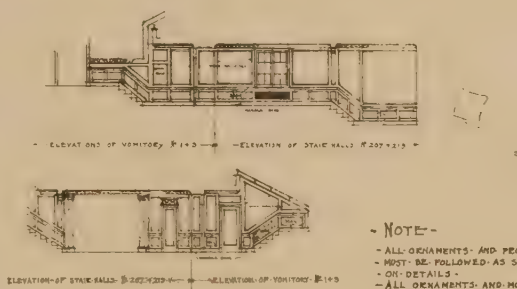
AUDITORIUM.

REPUBLIC THEATRE, BROOKLYN, N. Y.
Eugene De Rosa, Architect.

THEATRE & BUSINESS BUILDING
FOR WILLIAM SMALL ESQ.
S.E. CORNER OF SOUTH 1ST. & KEAP ST
BROOKLYN, N.Y.

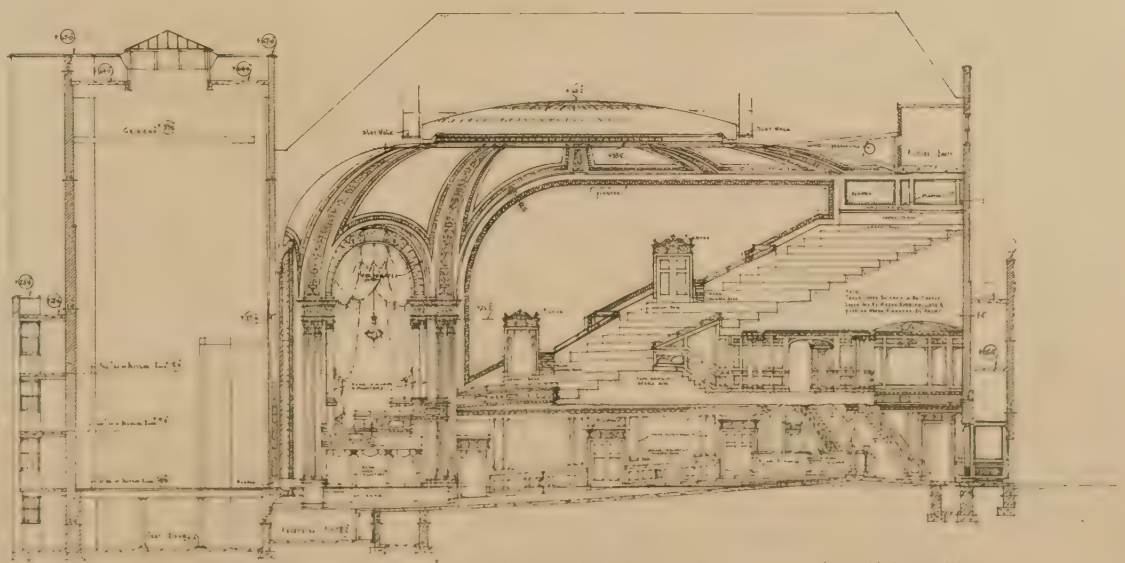
LONGITUDINAL & CROSS SECTION




DEVELOPED ELEVATION LOOKING TOWARDS REAR OF AUDITORIUM

- NOTE -
- ALL ORNAMENTS AND PROFILES
- MUST BE FOLLOWED AS SHOWN
- ON DETAILS -
- ALL ORNAMENTS AND MODELS
- MUST BE APPROVED BY ARCHITECT
- BEFORE ANY CAN BE APPLIED
- OR DELIVERED ON JOB -



LONGITUDINAL SECTION

EUGENE DE ROSA
ARCHITECT
NEW YORK CITY

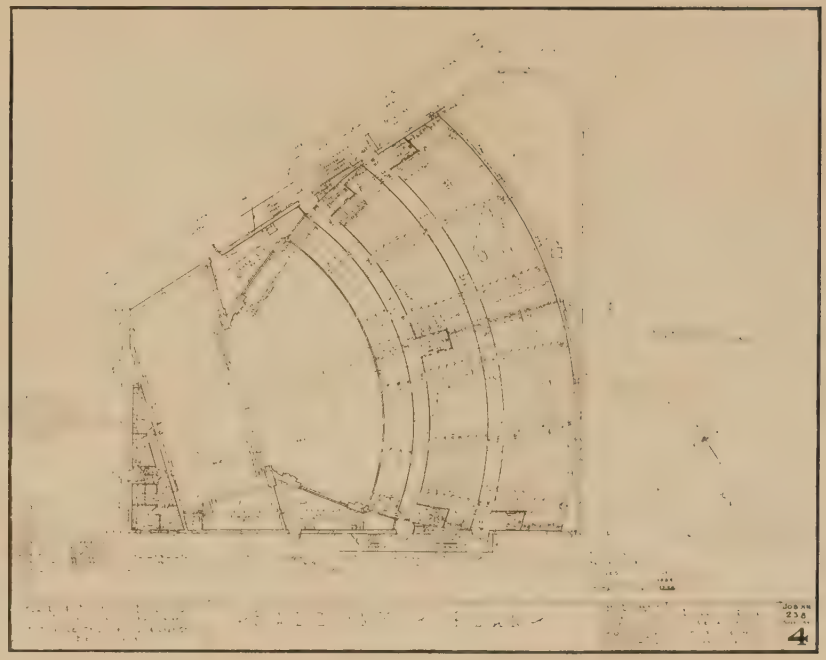
JOB NO. 238

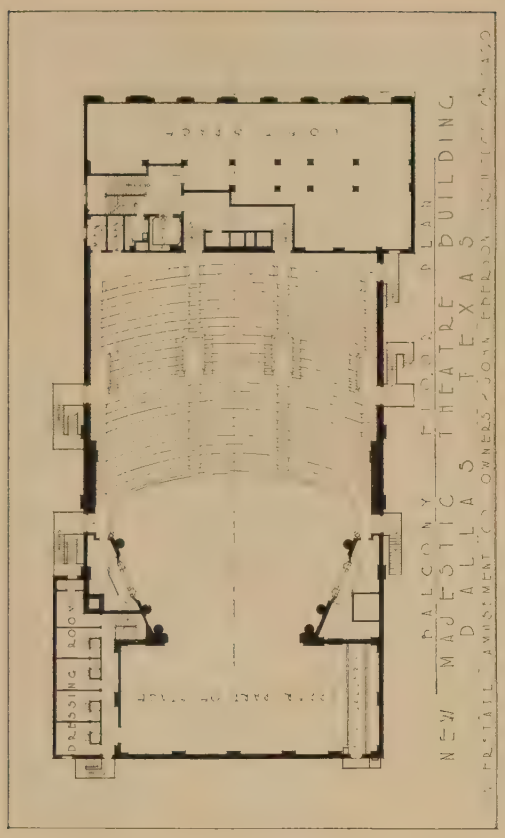
8

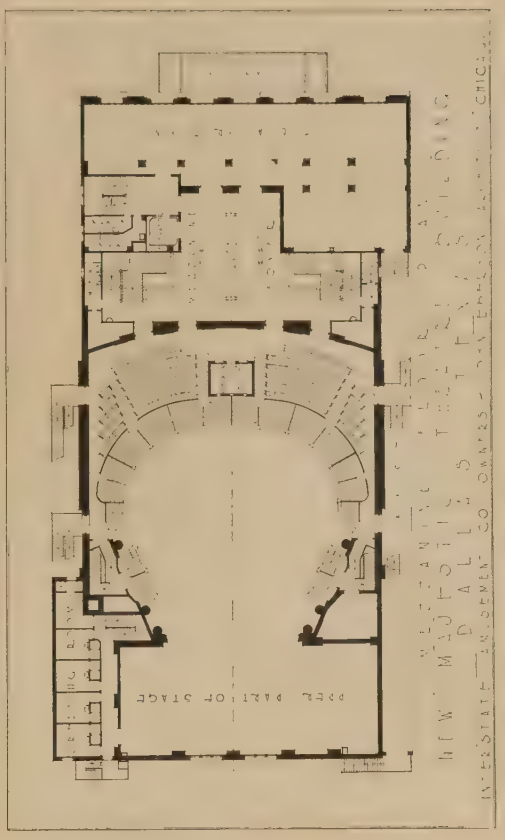
# The Republic Theatre Building Brooklyn, N. Y.

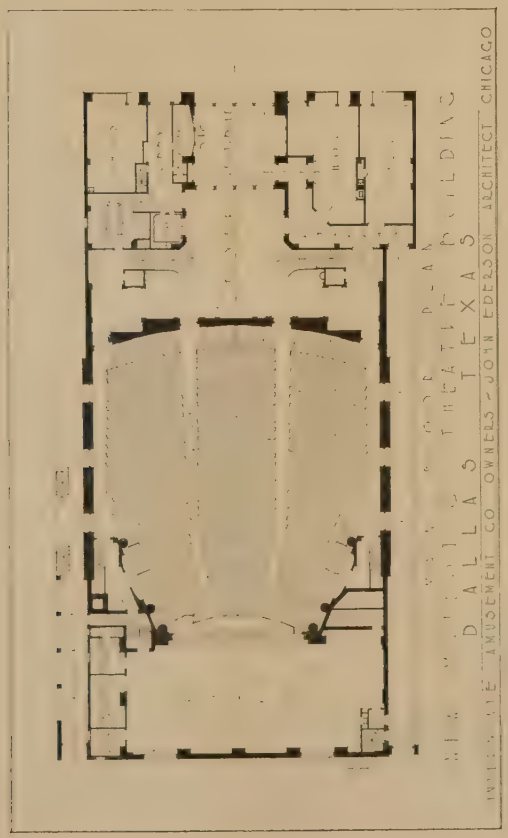
Eugene De Rosa, Architect

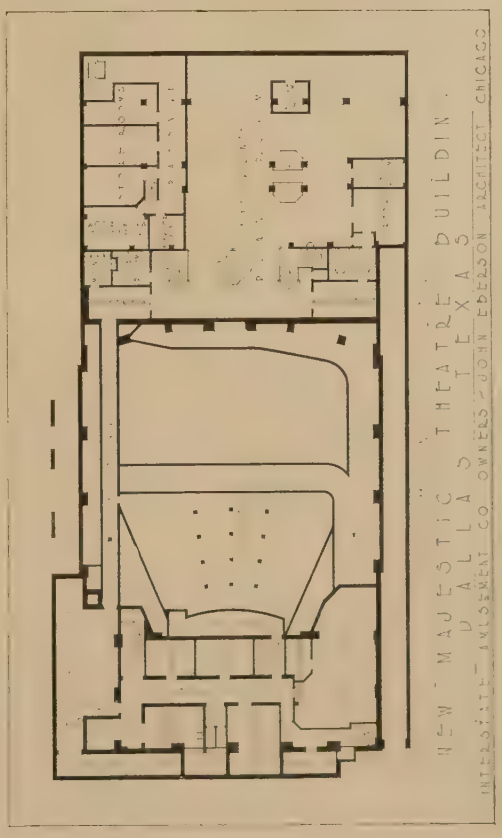
OCCASIONALLY an architect, through some peculiar circumstance of site or special requirements, has an opportunity to design a motion-picture house that affords the advantage of an especially good plan and increased seating capacity. Here the plot permitted an economical plan that gave eight hundred extra seats, all with a full view of stage. The ordinary rectangular motion-picture auditorium can provide only about two thousand satisfactory seats. The interior of the Republic is treated as a unit in decoration with dome-shaped ceiling.






John Eberson, Architect.

PLANS, MAJESTIC THEATRE, DALLAS, TEXAS.

DETAIL OF BOX AND BALCONY.

FOYER AND MEZZANINE.

MAJESTIC THEATRE, DALLAS, TEXAS. John Eberson, Architect.

# Byzantine Art

*By Professor C. R. Morey*
Princeton University

I

HISTORIANS use the word Byzantine to mean the Eastern Roman Empire, separated from the Western in 395 at the death of Theodosius the Great, and maintaining a separate existence down to the capture of Constantinople in 1453. During this period—roughly from the fourth to the fifteenth century—there grew up and flourished within the area of this Eastern empire the art which we call Byzantine. Broadly speaking, however, the limits of space and time above indicated do not hold for Byzantine art, for it continued even after that date, and extended beyond the empire's boundaries, both east and west, as the art of the Orthodox or Greek Church. It is still the style practised in the religious art of the Balkan States and Russia to-day. The language of the Eastern empire and the Eastern church was Greek, and the traditional Greek culture was the determining factor as well in Byzantine art, in contrast to the mediæval art of the Western empire, where the greater inroads and the lasting settlements of the barbarian invaders eventually transformed the Latin culture into one that was predominantly Teutonic. The art that issued from this mixture of Teuton and Latin in the West was Gothic, the final expression of Latin Christianity, as the Byzantine was the final expression of the Christianity of the East. One can gauge the wide divergence of the two by showing what each did with an old classic type—the group of mother and child—well represented by the "Peace and Wealth" of Kephisodotos. In the "Golden Virgin" of Amiens (Fig. 1) of the thirteenth century we see the transformation of the type into terms of Frankish emotion—the Virgin is a great lady and a queen, but one sung by troubadours rather than by monks, and utterly unclassic in the aura of romance which she carries with her. The Byzantine painter who did the Virgin (Fig. 2) of the same thirteenth century to which the Gothic Madonna belongs is still Greek in his intellectual clearness; his Mother of God is all dogma; and a dogma unobscured by the feminine mystery in which it is embodied. His Mary is no doubt divine, but she is not, like the French work, divinely feminine.

Fig. 1. Amiens cathedral. The Virgin of the Golden Portal.

There is then in this Byzantine art a Hellenic quality which stamps it as of the same race to which the "Peace and Wealth" belongs, in spite of the seventeen centuries that separate the two. But what shall we say of its flatness, this suppression of the third dimension which destroys reality and makes the figure so abstract and immaterial? It is a difference from the robust naturalism of Greek art which is not explained by the word "decadence," since, in point of fact, the Byzantine artist has a decorative sense and a power of spiritual expression superior to that of his ancient confrère. It is rather the indication of a new point of view and an altered artistic purpose—the result of some un-Greek factor acting upon Hellenic tradition. This factor is the second component of Byzantine style, an element difficult to isolate and trace to any particular source, but without question Oriental. Byzantine art, in fact, may be summarily described as the Orientalizing of Greek style.

By Orient in this connection we mean, of course, the Nearer East—Persia, Mesopotamia, Syria, and Egypt. When we think of the conquests of Alexander, and of the Greek dynasties that inherited his power—the Seleucid kings of Syria, the Ptolemies of Egypt, the Attalids of Asia Minor, or when we consider the Roman Empire that finally fell heir to these Eastern kingdoms—we sometimes forget the Oriental populations over which the Greek and Roman despots or governors ruled. Nevertheless, these ancient peoples still existed, clinging to old beliefs and practices that defied the civilizing efforts of Greek dynast and Roman emperor. The Greek culture imported into the East by Alexander and his successors, and fostered by the Romans, was concentrated in the capital cities like Antioch in Syria and Alexandria in Egypt; back of these oases of Hellenistic culture we must imagine a vast native hinterland into which the strange ideas found it difficult to penetrate. Alexandria, for example, produced a most brilliant Greek civilization, but the native Egyptian that inhabited the country districts up the Nile successfully resisted this influence, as he has resisted every other foreign culture ever since. Greeks, Ro-

Fig. 2. Venice. St. Mark's Madonna and Saints, thirteenth century.

mans, Arabs, and Englishmen have tried to convert him, but the habits of mind of the Egyptian fellahin are apparently still about what they were in the days of Rameses. So also throughout the eastern portions of the Roman empire, while the language was Greek, and while Greek dress and fashion obtained in the cities, there still remained a substratum of Oriental character that was ready to emerge when something cracked the Hellenistic veneer.

As the cracks began to appear, as the grip of Roman power weakened and Hellenistic culture began to lose its prestige, we see here and there the symptoms of a renaissance of Oriental thought. One such is the trend toward monotheistic cults in religion—for example, the sun-worship that swept the empire in the third century of our era. Another is the triumph of Christianity itself, an Eastern cult that was born in the most Oriental of Eastern lands. A simpler example is afforded by the mere change in the fashions of dress. Compare, for example, a Roman imperial lady of the first century with an empress of the sixth century in the person of Theodora, wife of Justinian, as she is represented with her suite in a mosaic of S. Vitale in Ravenna, offering a chalice to the church. We have here a fairly accurate index of the extent to which the Orient has transformed the classic point of view; the classic indifference to nudity is replaced in the costume of the Byzantine empress by a Semitic prudery that demands the complete concealment of the body; instead of the Roman simplicity of linen tunic and woollen mantle the sixth century has arrived at the jewelled brocades of the East.

This small example helps us to realize the change that six centuries wrought in the manners and customs of the Hellenistic East, but the transformation was, of course, too fundamental to be measured in mere externals of dress. It amounted to a substitution of a new attitude on the part of man toward his environment. For the Oriental point of view opposed to Greek monism a dualism of the most pronounced character. In religion the Oriental was a mystic; the Greek a materialist. The Oriental felt a contrast and separation between the human and the divine, the body and the soul, the material and the immaterial. The Greek did not. His gods were only greater men, and his world contained nothing that could not be measured in human terms. Hence he tended to deify mankind, and succeeded in his art in clothing humanity with a dignity which no other race has ever imparted to it, while the Orientals were forever despising the flesh, and by contrast attaining a more and more abstract conception of things spiritual. We recognize these Eastern traits in Christianity, with its strong sense of sin, and its severity toward material joys in which the Greek found so great beauty. The Hermes of Olympia contrasts strangely with the gods of Egypt and Assyria. These lose their human selves in a multiplicity of symbols, or become fantastic creatures whose material existence would be impossible to conceive. The Oriental notion of deity, purified by the religious genius of the Jews, finally reached a point of abstraction where God was conceivable only as a name, and passed in this form into primitive Christianity.

Now Byzantine art, and Byzantine civilization in general, consist of the reconciliation of these two widely divergent points of view. It is obvious that a long time was required for the assimilation, but we can see the leaven of the Orient working in Hellenistic art even as early as the first century of our era. From that time on its effect can be traced by a steady tendency toward a more abstract view of nature and an increasingly greater demand upon the imagination of the beholder. In relief, for example, the Greek rule is to appeal to the sense of touch and to the eye at the same time, *i. e.*, the observer is imagined to be at what may be called the normal standpoint, a distance far enough away to enable him to grasp the composition as a whole, yet not so far that he cannot follow the details of modelling. Hence the main gradations of plane, the general rise and fall of the surface of the flesh, and the essential folds of the drapery, are fully rendered in a Greek relief; a blind man, running his fingers over its surface, could derive a fairly accurate impression of its subject.

As time goes on, however, we find that the viewpoint moves farther away, so much so that the impression made upon the observer is entirely optical, *i. e.*, the impressions of form and mass are conveyed simply by the contrast of light and shade. The artist gives us no fine gradations of plane, but only broadly lighted surfaces defined by sharp outlines of shadow, and the values of depth and thickness have to be supplied by the imagination alone. In such reliefs of the third and fourth century the surfaces are flat (Fig. 3), and the depressions are mere grooves, corresponding to the heavy masses of shadow laid on by a painter to give the illusion of form. This technic is known as colorism, and constitutes the most obvious feature of Byzantine style.

Colorism denatures Greek design. A comparison of a Roman capital of the second century with one from the church of S. Vitale in Ravenna, dating in the sixth century, will be instructive in this connection. In the Roman capital Greek proportional design is retained in the differing heights of the leaves, which also project from the bell and conform to nature in their droop and thickness. In the proto-Byzantine capital the surface is as flat as a painting, and we realize the leaves merely as broad spots of light set off sharply by intervening spots of darkness. In fact, it is clear that the artist does not much care whether we realize

Fig. 3. Constantinople, Ottoman Museum. Sarcophagus of third century.

the leaves at all; he is concerned chiefly with his pleasing alternation of light and shade, with the result that he nearly cuts loose from nature altogether, in order to produce a charming pattern of abstract and geometrical design.

The beginnings of Byzantine can thus be described, so far as design is concerned, as the change from an ideal of stability and proportion, which was Greek, toward one of movement, and rhythmic alternation of light and shade, which was Oriental (Fig. 4). The proto-Byzantine artists still employ the Greek motifs, but they squeeze the naturalism out of them, and make them serve an un-Greek purpose.

But when we come to speak of the subject-matter of this developing Byzantine art, the iconography that it used when it took up the task of rendering biblical history, it will be to develop an apparent paradox. For we shall find that although Byzantine design, as we have seen, tended toward abstraction, the Byzantine artists who about the fifth century of our era began to reorganize the cycle of Christian imagery that had grown up in the first four centuries of Christianity, gave a narrative turn to their scenes, and added a wealth of detail that makes their paintings and reliefs seem at first sight very realistic.

Fig. 4. Ravenna, Museum. Ivory throne of Maximianus, sixth century.

As if to increase the paradox, we find on the other hand that during the primitive ages of the church, when the new faith was first spreading among the Hellenic populations of the great cities of the empire—in the Hellenistic period of Christianity, in short—the episodes of the life of Christ and of the Old Testament are conceived in a very symbolic manner Here lies an apparent contradiction: Hellenistic design being natural, and Byzantine abstract; Hellenistic iconography being abstract, and Byzantine literal.

The reason for this is not, however, far to seek, and the paradox is more apparent than real. We must remember the Greek aversion to the commonplace, and recall that it is very hard to find historical events, or actual renderings of other than mythological episodes in Greek art early or late. Its essential idealism prevented their occurrence; instead of giving you the actual event, the Greek artists had recourse to something parallel in his mythology, or an allegory. Thus the Athenians celebrated their victory over the Persians by filling the metopes of the Parthenon with gods conquering giants, Greeks Amazons, and Lapiths vanquishing centaurs, and the chief monument to the victory of the kings of Pergamon over the Gauls of Asia Minor is the wonderful frieze of the Battle of Gods and Giants which decorated the Pergamene Altar of Zeus. The "Peace and Wealth" of Kephisodotos is a thoroughly Greek creation in this respect, and to this tendency to sublimate human achievement, avoiding the details thereof, we owe the most beautiful type that Greek art has left us, the "Winged Victory."

Christianity, as we have said, spread first among the Hellenized Jews and Gentiles of the eastern cities of the empire, and our earliest Christian art is, therefore, the result of the Hellenic spirit reacting to the new faith. It was Hellenism that gave Christianity its art, for the Jews that gave us Christianity had no representative art in which to clothe its dogmas and stories. Thus it happens that for the first four centuries of the church, its art bears the unmistakable impress of the allegorical habit of the Hellenistic mind. The earliest Christian scenes we have, in the frescoes of the catacombs of Rome, are very brief, and limited as to subject, because they are conceived not so much as real episodes, but as symbols of salvation, put upon his tomb by the individual believer as a guaranty of his own immortality and deliverance from sin. Such is the story of Jonah, repeated one hundred and fifty times in the catacombs, the deliverance of Isaac from the hand of his father, Abraham, the saving of Noah from the Flood, and of Daniel from the Den of Lions, etc. The healing miracles of Christ have the same significance, and show it by omitting Christ at times altogether, as in the Healing of the Paralytic, which consists solely of the paralytic obeying the Lord's command, and walking off with his bed upon his back.

As time goes on these Hellenistic scenes acquire some slight detail, particularly when we arrive at the fourth century and see them again upon the sarcophagi. But even here they are so brief that ten or so have to be used to fill up the front. Even when the church took hold of the new Christian artistic cycle, and began to use it in the decoration of the churches that multiplied all over the empire after the recognition of Christianity by Constantine at the beginning of the fourth century, the symbolic stamp is still apparent. See, for instance, the Parting of Lot and Abraham (Fig. 5), executed in mosaic on the walls of S. Maria Maggiore at Rome, in which the figure of Isaac is introduced, although he was not born until long after the event represented. He is here because he symbolizes Christ, and leads his church, in the person of Abraham and his family, away from Lot, who is the Jewish synagogue, and is doomed to Sodom and destruction.

It is in the fifth century, when Christianity was no longer a city cult, and had spread into the Oriental hinterlands of Syria and Egypt, that the effect of the Eastern point of view begins to show itself in Christian iconography. It transpires in the Oriental love of a story, clearly seen, for instance, in the earliest illustrated Genesis, painted in Asia Minor in the fifth century, and now in the Library of Vienna. The story of Joseph's Dream is here related with all neces-

Fig. 5. Rome. S. Maria Maggiore, mosaic.

sary detail and not a bit of symbolism. We can, in fact, trace the gradual encroachment of Eastern narrative on Hellenistic allegory through the whole course of Christian art from the time of Constantine to the sixth century by looking at successive examples of the rendering of almost any episode in the Life of Christ. Take, for example, the Entry into Jerusalem. On the sarcophagi of the fourth century Christ rides astride the ass upon a mantle spread before him by a man, and little more is ever added to the scene. But a century later, in Egypt, we find Him riding side-saddle as Eastern people ride, and an Eastern rug has replaced the mantle, while from the Gospel story the artist has added also the children strewing palm branches in His way. Hellenistic allegory still clings to the scene, in the cross that Christ carries, and the personification of the city of Jerusalem that comes to meet Him. But even these reminiscences disappear when the Byzantine scene is finally formed, which reproduces the story with faithful adherence to the Gospel account. We see the city itself, the disciples that followed the Lord, the children that strew branches in His path, and all the details of the Feast of Palms.

Fig. 6. Paris, Bibliothèque Nationale. Miniature of the Sinope Gospel.

An early example of Byzantine handling of the Christian story may be seen in a fragment of the Gospel of Matthew, now in the Bibliothèque Nationale at Paris. It was found by a French officer at Sinope, and is known as the Sinope fragment (Fig. 6). We see on one of its pages the tragedy of John the Baptist, whose decapitated body lies in a prison to the right, and is mourned by two of his comrades in prison, while to the left Herod, wearing the diadem of a Byzantine emperor, reclines at his feast, and Herodias receives the head of the Baptist. Moses and David flank the scene; on David's scroll appears the extract from Psalms that alludes to the scene: "Precious before the Lord is the death of His saints."

Thus the little scene is still an allegory by virtue of the Old Testament allusions inserted at the sides. But you will notice that the union of the two elements—the literal narrative of the East and the Hellenistic allegory—is mechanical. The personifications of the earlier period, the old Greek idealizing of the theme, is totally absent in the episode itself. These little figures are Oriental through and through, the richness of their costumes, the trappings of the couch, the very facial types are at home in the East. Lastly, however well the story is told, the actors therein are no more than puppets; the figures are as flat as paper, cast no shadow, and stand on nothing. With all the literal detail, a general air of unreality pervades the picture.

Here then is the solution of our paradox. The pseudo-realism of this proto-Byzantine art is simply the paraphernalia of the Oriental story-teller; the figures themselves are little more alive than hieroglyphs. Christian art of the Hellenistic period may have a symbolic conception of its episodes, but the actors therein retain a modicum of Greek vitality; in Byzantine art this vitality is lost, however literally the story be told. We shall see later how this contrast between the realistic conception of the scene as a whole and the curious abstraction of the personages thereof lends a surprising spiritual quality to the Byzantine art of later periods, when the Hellenic factor becomes more potent, and the figures increase in size and dignity. But in the sixth century, when the Gospel of Sinope was written and illuminated, one can hardly feel the Hellenic element in the art at all; the very purple of the vellum and the gold in which the text is written seems to dazzle our eyes with Oriental magnificence.

(*To be continued*)

## Pennsylvania State College to Enlarge the Architectural Department

ANNOUNCEMENT was made recently that a committee of prominent Pennsylvania architects, headed by M. I. Kast, after making a study of the Departments of Architecture and Architectural Engineering of the Pennsylvania State College, has indorsed the work done by these divisions of the College School of Engineering and made recommendations for various changes in the departments as soon as money is available. If the course were extended to five years instead of four, the committee stated, artistic training and appreciation of art could be stressed more than at present.

Plans are now under way for raising a $2,000,000 health-and-welfare building fund that will enable the college to admit a larger number of students to the architectural courses and will mark the first step toward the development of the college into the Pennsylvania State University, capable of accommodating an enrolment of 10,000 students.

FRONT ELEVATION.

HOUSE, LEONARD E. GYLLENHAAL, BRYN ATHYN, PA.

Walker & Carswell, Architects.

REAR ELEVATION.


FIRST FLOOR PLAN


SECOND FLOOR PLAN

SCALE ⅛ INCH = 1 FOOT

HOUSE FOR MR. L.E. GYLLENHAAL
BRYN ATHYN PENNSYLVANIA
WALKER AND CARSWELL ARCHITECTS
BRYN ATHYN PENNSYLVANIA

# Small Mission-Style Church of Three Floors

*By Charles Alma Byers*

THIS attractive little church building, representing a modification of the mission style of architecture, actually possesses, to all intents and purposes, three floors. It is therefore unusually complete and commodious, making of it quite a model church plan. The general outside appearance is also exceptionally pleasing.

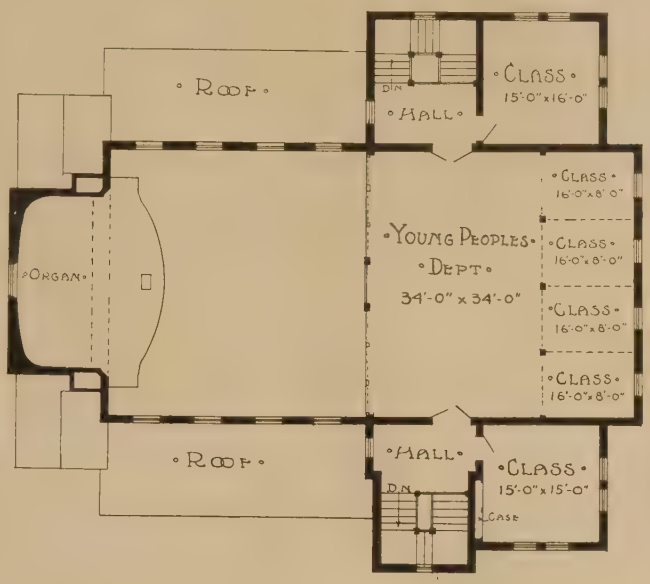
For the regular church services it is capable of accommodating a total of 386, as follows: main auditorium, 176; choir, 30; Sunday-school department, 90; auditorium-balcony portion of young people's department, 90. In the basement is a large social hall, with stage and dressing-rooms, which seats 350. This hall also serves as a banquet-room, when it will accommodate 250 at tables, and is further used as a junior department. There are numerous classrooms, a well-planned kitchen, pastor's study, choir-room, boys' clubroom, secretary's office, and various other divisions. The equipment includes gas-radiators for heating, a ventilating system, pipe-organ, and so forth.

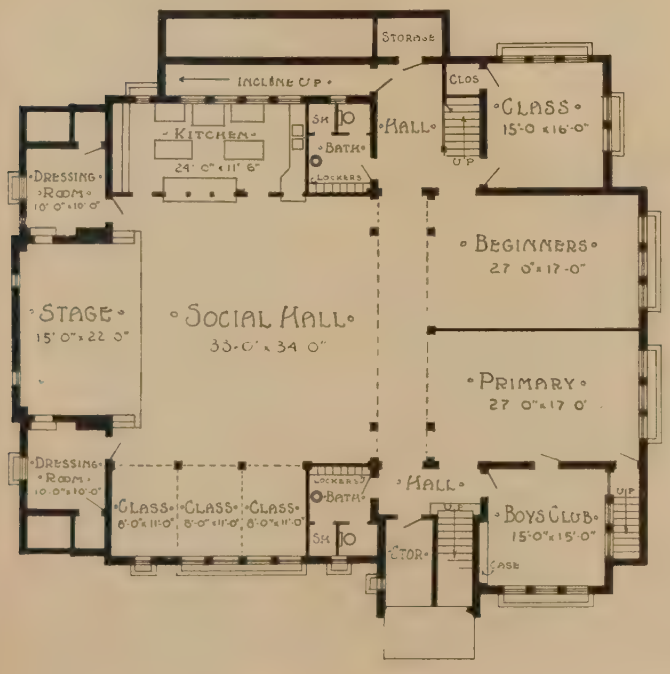
The building is of frame construction, with the outside walls consisting of pure white cement stucco. The roof is of red roofing tile, and the wood trimming is painted pearl gray.

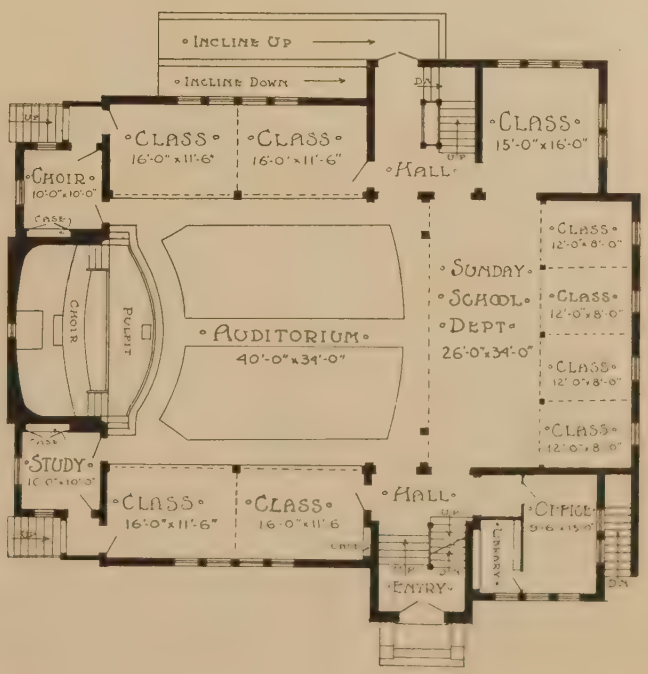
The foundation and basement walls are of concrete, the basement walls being finished inside with plaster.

The interior finish consists of Oregon pine woodwork throughout, which is finished in oak stain. The woodwork in the kitchen, however, is in white enamel. The pews are of natural oak, and the pulpit is furnished to match. All walls are plastered and tinted, and the floors of the main and second floors are of pine, while the basement is floored with cement.

The building is located in Artesia, California, and is the edifice of the First Methodist Episcopal Church. It was designed by Arthur G. Lindley, of Los Angeles. The building has just been completed at a total cost of about $30,000, exclusive of the equipment and furnishing.



FIRST METHODIST EPISCOPAL CHURCH, ARTESIA, CALIF.

Arthur G. Lindley, Architect.

# Construction of the Small House

*By H. Vandervoort Walsh*
Instructor, Architectural School, Columbia University, New York

ARTICLE XXI

## TRADITIONS OF THE CONSTRUCTION OF DOORS AND WINDOWS

### WINDOWS

WHAT are the elements of design in the elevations of the small house? Surely they are not the five classical orders, as commonly used in monumental architecture, but rather they are the doors and windows. The walls would be plain and uninteresting but for the holes where the doors and windows are placed. The fenestration cannot be too large or too small, and here is the problem. We desire plenty of light and air, but we must also recognize that windows which are too large leave little wall space in the rooms, are cold in winter, and appear less homelike than smaller and snugger appearing ones. Then, too, windows which are of plain, clear glass in very large sheets make these holes appear open and black, and this is quite contrary to our traditions of the windows of a home which should be safe and cozy. The omission of muntins from the windows of small houses is a great mistake in design, even though these small panes require a little more work to wash.

Our traditions of door and window construction come, as do other structural traditions, from England. Undoubtedly the earliest structures had no windows at all, but were lighted by the openings through the defective construction of the walls and also through the door. Our ancestors of those days were more interested in protecting themselves from outside intruders than they were in fresh air and sunshine in their rooms. When it was safe to build windows they were only holes in the walls. Some of the old huts, built on crucks, a construction previously described, had holes in the roofs for windows which served the double purpose of letting in light and letting out the smoke of the fire. We get an inkling of what a window was from the very derivation of the word itself, which comes from the old Norse word "wind-auga" or wind-eye. This does not sound like a glazed sash, nor does the other Anglo-Saxon term for window, "wind-dur," meaning wind-door, suggest a closed aperture. Of course these windows were undoubtedly closed in some way or other in stormy weather or when danger was outside. Probably a wooden board or shutter was used, which had a small peep-hole cut in it. These were hung from the top, and when opened were held in position with a prop on the outside.

There is no certainty of when the smaller domestic houses of England began to use glazed windows. In 1519 William Horman wrote: "I wyll haue a latesse before the glasse for brekynge." This would suggest that windows of latticework were preferred because of the cost of glass, and this might have been filled instead with canvas, horn, or tile to let in some light. But another writer in 1562 says: "Lattice keepeth out the light and letteth in the winde." When glass windows were used, however, the small bits of glass were held in position by lead in diamond-shaped patterns which probably were adopted from the form of the old lattice windows, although later it was found that rectangular panes were cheaper. But the use of glass in small housees is comparatively modern, for, before the reign of Henry VIII, glass windows were rare except in churches and gentlemen's houses.

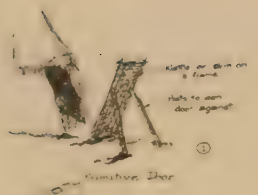
Traditions of stone mullioned windows were very strong, and these brought about a system of building wooden, unglazed sash which had mullions made of oak, set in a heavy oak frame. One of these is shown in the drawings. The word "sash" is derived from the French "chassis," and its earliest spelling was "shas" or "shash." In a book, "Mechanick Exercises," written by Moxon in 1700, he mentions "shas frames and shas lights." It was these old, unglazed wooden sash which gave birth to the modern double-hung and casement window.

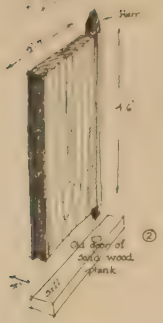
As first made, they opened by sliding in their frames, either horizontally or vertically. If they were built to slide vertically they were not counterbalanced with weights as in our modern windows, but were held in position with a hook which caught in notches cut in the side of the frame. It is interesting to quote here what William Horman wrote in 1519: "I haue many prety wyndowes shette with louys goynge up and downe."

It is supposed that the idea of counterbalancing these sash by means of weights, attached by a cord running up over a pulley, came to England from Holland. This type began to be used about the latter half of the seventeenth century, and although the early examples were clumsy and heavy and the groove in which the sash were made to run was worked out in the solid, yet by the process of years of refinement the modern double-hung window was evolved. The traditions of these sliding windows were brought to America in Colonial days, and they proved to be the most suitable types for our rigorous climate, whereas the windows which swung like doors from their sides, called casement windows, did not prove so weather-resisting.

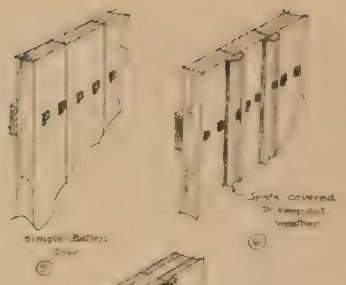
To hear some individuals talk, one would almost think that the double-hung window was a modern, American invention of artistic atrociousness, and that the casement window was peculiarly English, having the sole right to artistic merit. As a matter of fact, the fashion in England for casement windows was an imported one from the Continent, which never reached certain farm sections of England. In fact, some years ago certain agricultural laborers refused to live in cottages fitted with casement windows which had been built by a district council. The Georgian revival which had so much influence upon our early Colonial work, and which is also very much alive to-day in this country, brought into fashion again the traditional double-hung window.

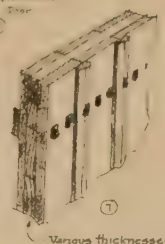
Of course there is much to be said against the artistic appearance of the double-hung window as compared with the casement window, but when all is said and done we still go on using more double-hung windows than casement windows, for in the majority of cases they prove to be more substantial in resisting the heavy winds and storms of our climate. Every now and again we hear some prominent architect urging the use of casement windows, and we can find plenty of manufacturers of casement-window hardware telling us to use them, and the makers of steel casement sash drum in our ears the practical qualities of steel sash, and one is led to wonder why they are not used more. But traditions are stronger than advertisements.

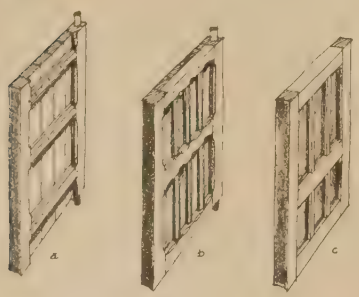


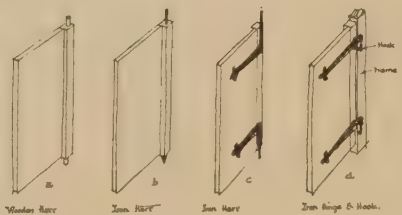





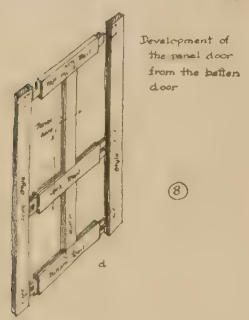



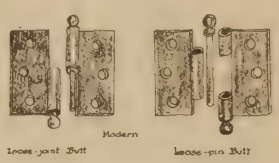



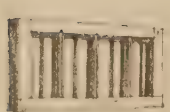





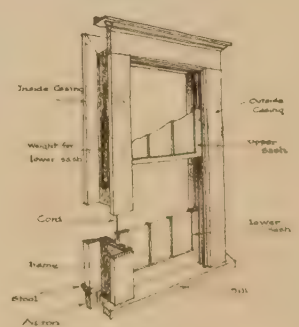


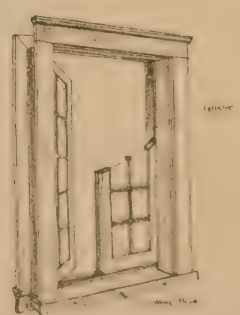












The successful placing and careful detailing of the doors and windows of a small house will have more to do with the architectural attractiveness of the structure than anything else, for, after all, the most important part of any elevation is the treatment of the holes in it.

### Doors

There is an ancient English expression, "put t' duur i' t' hoile" (put the door in the hole), which comes down from the times when the door was not fastened by hinges and did not swing into place, but had to be lifted up and placed over the door opening. When the door was opened it leaned against two stakes driven into the ground, or some similar support. These old doors were very small, as compared with our modern doors, and were probably made of light wattle, for we read in some old rhymes of throwing doors and windows on the attacking enemy. Even when solid-wood doors were used they were made of one piece of wood. Doors made of a number of planks of wood fastened together by battens or ledges were a later type. It was noticed that these sagged when hung in position and cross bracing was found necessary. These old batten or ledged doors were swung on pivots of wood which rested in sockets bored into the lintel and the sill. These pivots were called harrs, and later were made of iron. The evolution of the hinge idea from the harr is shown in a series of drawings. For many years these great hinges became a very decorative part of the door, and great care was taken with their designing. Our modern butt is quite the opposite in its characteristics, for instead of being a feature upon the face of the door it is completely hidden, except the socket and pin.

In building the old ledged doors, the planks were set vertically and held together with battens through which were driven wooden pegs. The ends of these pegs were chamfered, and a curious mark of tradition can be noted in the later doors which were fastened with iron pins that were also chamfered on the ends, like the wooden pins. Later construction of doors shows the use of weather-stripping over the vertical joints and also the use of various layers of planks, with their grains running at right angles in each alternate layer. The end timber upon which the harr was placed was thicker than the planking, and later the timber upon the opposite side was made heavier in order to strengthen the crude locks. With this change and the moving of the battens to the upper and lower edges of the door, and the introduction of weather-stripping over the cracks between planks, there was created the prototype for the modern panelled door. It was only a slight step from this, to frame the styles, top and bottom rails, and lock rails around the panels between them.

Another type of door that was of traditional construction, and from the name of which we derive our word hatch, was the so-called "heck-door." This door corresponds to the common "Dutch-door," which is familiar to us in Dutch Colonial houses. It was capable of being opened in two halves, the upper half could be swung in without the lower half. This type of door was invented from the necessity of protection against the sudden intrusion of strangers and also small animals, like pigs and hens.

The oldest method of fastening doors was to draw a long bar across them on the inside, very much like the bars which were used in Colonial houses in this country. A hole was cut into the jamb into which this bar could be run when locked, and in the opposite jamb was another hole into which it could be slid out of the way. The disadvantage of this type of door fastening was that it could only be fastened and unfastened from the inside. This led to other devices, such as a bolt that could be operated from the outside and a latch that could be lifted by a string, or a hole was cut in the door through which a small bit of metal could be passed that could be used as a lift for the latch.

To-day we think of locks and bolts and latches as distinct, but this was not so at the time they were being evolved. Our word lock was used in the sense of securing the door in any manner. But gradually, as, step by step, the various mechanisms for locking a door were developed, the word became limited in its meaning, although we sometimes use it to-day in the sense of closing the door.

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# Facts from a Survey of Residence Lighting

*By M. Luckiesh*

THOSE acquainted with lighting and its possibilities in residences know that in general the wiring is inadequate and the lighting is deplorable. There is much improvement in these factors in middle-class homes which are being built at the present time, but by no means can it be said that wholly adequate wiring and proper lighting are being provided in many of the new houses and apartments. The writer has been conducting an extensive detailed survey of wiring and lighting as it exists to-day in the urban middle-class home, from which some data of interest to the architect, builder, and householder have been obtained.

Only one-third of the homes existing at the present time are wired for electricity, so that a large field exists in providing electric lighting for the 14,000,000 unwired homes as well as in raising the standard of lighting in the 7,000,000 wired homes. These phases and many other details of the survey are not of direct interest to the readers of this journal, so they will not be discussed, with the exception of some which will help the architect, builder, and householder to appreciate more fully the past and present shortcomings.

Large groups of wired urban middle-class homes in various cities have been studied. The aggregate represents equal numbers of rented homes and of homes owned by the occupant. This appears quite fair because the census of 1920 revealed the fact that 54 per cent of the population of this country live in rented homes. So far only urban middle-class homes have been considered, but the conclusions can be extended safely to homes in towns, villages, and rural districts. At any rate, about one-half the population of this country live in places of 2,500 or more inhabitants.

Certain interesting facts pertaining to rented homes and to homes occupied by the owner were obtained, particularly as related to the number of rooms in the home. In Fig. I are plotted the relative number of rented and of "owned" homes against the number of rooms. These represent two large groups of equal numbers of rented homes and of homes occupied by the owner. It is seen then that the maximum of the rented group is at about 5.8 rooms per home. In other words, the most popular size of a rented home is about six rooms. The maximum for the "owned" group is at about 7.3 rooms per home, indicating that the most popular home occupied by the owner has approximately seven rooms.

A diagrammatic view of this is presented in Fig. II. Here the percentage of rented and of owned homes has

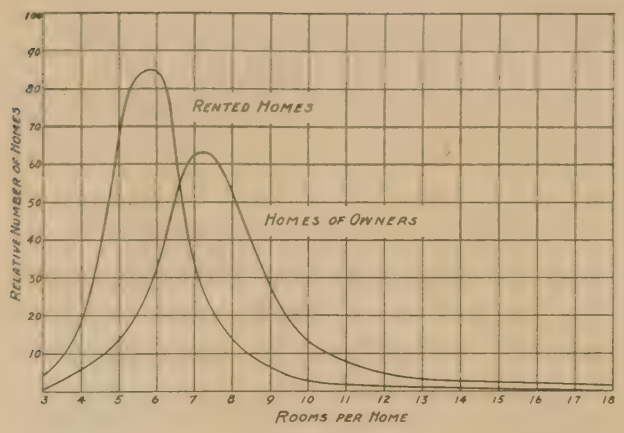


Fig. I.

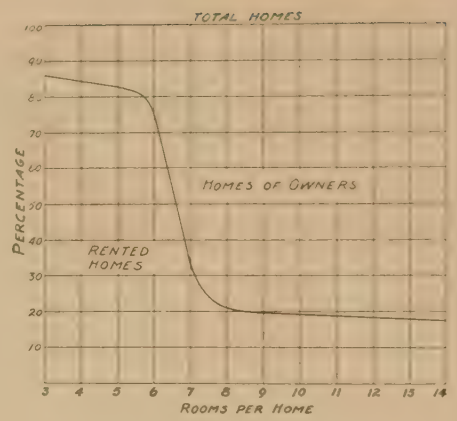


Fig. II

been computed for each size of home. The transition between predominantly rented homes and homes occupied by the owner takes place in the region of six rooms per home. For example, 77 per cent of the homes having six rooms or less are rented and 75 per cent of the homes having more than six rooms are owned by the occupant. Fig. II shows plainly that the homes having a small number of rooms are predominantly rented, and as we pass from the six-room home to the seven-room home we pass from the region of predominantly rented to the region of predominantly owned. In Fig. II the central portion of the diagram is more dependable than the extreme portions because of the enormously greater number of homes of the medium sizes represented in the survey. However, the diagram can safely be used to represent the approximate conditions as determined by the groups of homes which have been analyzed.

Some data pertaining to the newer houses showed fairly definite desires on the part of the owners or prospective owners of modern single houses. In the case of bungalows it appears that a size of five rooms is the most popular, with the six-room bungalow a close second. One-and-one-half-story houses of seven rooms appear to rank first, with six rooms ranking second, and eight rooms third. For the two-story house seven rooms are most popular, with eight rooms next, and six rooms ranking third. Frame houses are of course still more numerous among the new houses, but there appears to be a strong tendency to desire stucco and brick construction. If we have interpreted the tendency correctly, the desire for stucco houses in the middle class is pressing that for frame houses closely, with brick a fair third in rank. Breakfast nooks, sleeping-porches, pantries, and sunrooms are much in evidence in the present tendency.

A detailed analysis of the survey data provided an average home in respect to all the details studied. Conservative wiring and lighting were then designed for this average urban middle-class home and this was termed the "conservative ideal." From this the present status of lighting in this class of homes was determined. Some of the chief facts are presented in Table I.

TABLE I

THE STATUS OF VARIOUS PHASES OF WIRING AND LIGHTING IN PER CENT OF THE CONSERVATIVE IDEAL

| | |
|---|---|
| Total wattage of lamp per home | 40 per cent |
| Consumption of electricity for lighting | 50 " |
| Convenience outlets per home | 33 " |
| Portable lamps | 25 " |
| Ceiling fixtures (regardless of design) | 100 " |
| Satisfactory ceiling fixtures | 50 " |
| Wall brackets (utilitarian) | 27 " |

A brief interpretation of Table I appears desirable. The total watts of lamps per home must be increased 150 per cent on the average if lighting is to be brought to the level of the conservative standard. This does not mean that all the lamps will be operated at the same time in any given room, but rather that lighting to suit various activities or moods will be available as desired.

Convenience outlets are far too few at present, particularly in the smaller homes having from three to eight rooms. For the average home, nine is a conservative number. This means there is one for each room in a seven-room home with two extra for the living-room. There is a growing tendency—and well there should be—toward a greater use of portable lamps. For this reason a conservative rule is one convenience outlet for each fifty square feet in the living-room. The new duplex convenience outlet should be widely adopted because it permits two connections to each outlet.

An average of only two portable lamps per home was revealed. When we consider the decorative possibilities of small portables on the buffet or mantel and the usefulness of a library lamp on the reading-table, a floor lamp, a piano lamp, a desk lamp, and pairs of portables on the dressing-tables it is easy to account for eight portables in the average home. Hence portables should be increased to four times their present number. Convenience outlets must be provided for them.

The use of ceiling fixtures is quite complete, although many of them are far from satisfactory from the standpoint of eye comfort. Best practice demands that all lamps be shaded or concealed from the eye in some manner. Inasmuch as the use of ceiling fixtures seem to be sufficiently extensive it only remains to use correct ones in which the lamps are shaded. For the dining-room the ceiling fixture should be such as to illuminate the table predominantly without the light sources being visible to the diners. The survey shows that 25 per cent of the ceiling fixtures in use in dining-rooms are suspended bowls. These do not provide predominant light on the table. More than 10 per cent of the ceiling fixtures in use do not have shades. It appears that half the total number of ceiling fixtures in use should either be improved by proper shades or replaced by modern fixtures.

It is evident that useful wall-brackets have not been utilized in the home to the degree that they should be used. In the average existing wired home their number could be increased about 300 per cent in order to provide the best in lighting. Two brackets spanning the mirror in the bathroom, two placed similarly in respect to the dressers in each of the three bedrooms, and one over the sink in the kitchen account for nine brackets in the average home, where on an average only two exist to-day. In this "conservative ideal" average home only eight brackets are specified. In the fore-

going mention of nine brackets we did not include any used chiefly for decorative purposes. In the living-room several wall-brackets can be used with satisfaction in a purely decorative manner. Thus it is seen that eight brackets can be readily used in the average home.

In the foregoing paragraphs some of the chief points revealed by this residence lighting survey have been presented which should be of interest to the architect, builder, and householder. The lighting and wiring conditions which exist to-day are not to be used as a standard, but rather to show, in comparison with a conservative ideal, that residence lighting and wiring in general is lagging far behind what lighting experts know to be good practice. The survey also has shown the influence of the number of rooms on the percentage of rented homes as determined by data obtained from large groups of wired urban middle-class homes.

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# Concrete Construction

*By DeWitt Clinton Pond, M.A.*

SIXTEENTH ARTICLE

IN order to complete the study of the 395 Hudson Street Building, it will be necessary to investigate the design of typical stair construction. In a steel building, stair design is included in the ornamental or architectural ironwork, and all the structural designer has to provide are the beams which will carry the stair construction. In a concrete building the stairs themselves are of concrete and among the other structural drawings there are those which give the details of the stairs.

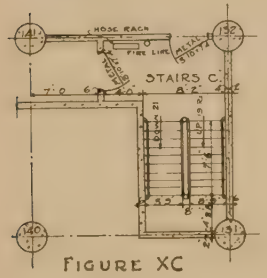

FIGURE XC

In the part of the 395 Hudson Street Building which has been furnishing the basis for other discussions there are no stairs, so for the purpose of this investigation, another part will be selected. In a portion of the building, included between Columns 131, 132, 140, and 141 will be found Stair *C*, which is as typical as any in the building. Figure XC shows the plan of this stairway at the second floor, and Figures XCI and XCII show the structural plan and section. In Figure XCIII is shown the structural floor plan and the method of framing around the stair well. In the plan and section it can be seen that there are 19 risers from floor to floor. There are 10 to the platform and 9 from the platform to the floor above. In the longer run there are 10 risers and 9 treads. The treads measure 10 inches wide, so the horizontal distance from the first riser to the platform is 90 inches, or 7 feet 6 inches. The beams at the floor and platform are $3\frac{1}{2}$ inches away from the risers, which makes the horizontal distance between beams 8 feet 1 inch. Assuming the beams to be 6 inches wide, the distance between centres of supports will be taken as 8 feet 7 inches. In the design of stairs the horizontal distance is always used.

In carrying out the design the stairs are divided into two parts—the slab which is under the treads and risers, and the treads and risers themselves. The slab is considered as being the only structural member; the treads and risers are simply triangular prisms of concrete resting upon this slab. The first step in the design is the determination of the thickness of the slab. In order to do this, it is necessary to determine the load, and the thickness of the slab must be assumed. The assumption will be made that this is a 6-inch slab weighing 72 pounds per foot.

As has been stated, the treads and risers are formed by triangular prisms of concrete, and the transverse sections of these prisms are inverted right triangles with the bases measuring 10 inches and with altitudes measuring $7\frac{5}{8}$ inches. One-half of the altitude will be $3\frac{3}{4}$ inches. If the treads and risers were spread out over the slab as a layer of concrete, this layer would measure $3\frac{3}{4}$ inches thick and would weigh 45 pounds per square foot. So far the unit weight of the slab and the weight of the treads and risers have been found. The only remaining load will be the live load of 100 pounds. The loads can be listed as follows:

| | | | |
|---|---|---|---|
| Treads..... | 45 | pounds | per square foot. |
| Slab..... | 72 | " | " |
| Live load..... | 100 | " | " |
| Total..... | 217 | " | " |

The thickness of the structural slab is determined in the same manner as the thickness of an ordinary slab. It might be well to note that the figures given in the calculations do not always agree with those shown in Figures XCI and XCII. The calculations are made before the structural drawings and in many cases the dimensions must be assumed. When the structural drawings are made exact dimensions are determined, and if these do not alter the assumed figures so as to increase the spans, or add to the loads, it is not considered necessary to recheck the design calculations. As a case which illustrates this it will be noted that the distance between supports, as shown in Figure XCI, and measured horizontally, is found by adding 6 inches, 7 feet 6 inches, and $3\frac{1}{2}$ inches. This gives a total of 8 feet $3\frac{1}{2}$ inches, which is less than the assumed distance of 8 feet 7 inches. As these discussions are carried out on the basis of the engineers' calculations, the latter figure will be used, and the clear span will be taken as 8 feet 1 inch. The load per square foot has been found to be 217 pounds, so the load on the slab will be $217 \times 8.1 = 1{,}757$ pounds. As the slab is considered as a simple beam the formula for bending will be $M = \frac{1}{8}wl$. The bending moment is determined by the following calculations.

$$M = \frac{1{,}757 \times 8.6 \times 12}{8} = 22{,}700 \text{ inch-pounds.}$$

As has been determined in previous discussions, the depth of the slab can be found by—first, dividing the moment in inch-pounds by 1,279.5, and, second, by extracting the square root of the result.

$$\frac{22{,}700}{1{,}280} = 17.17 = d^2$$

$$d = 4.2$$

Adding $1\frac{1}{4}$ inches to this figure will give a slab thickness of $5\frac{1}{2}$ inches as shown in the figure.

The next step is the determination of the area of the steel. As the slab thickness has been decreased by one-half an inch, the weight per square foot of the slab will be decreased by 6 pounds and the unit load will be 211 pounds. In order to find the required area of steel, it will be better to use this load and carry through the calculations for the

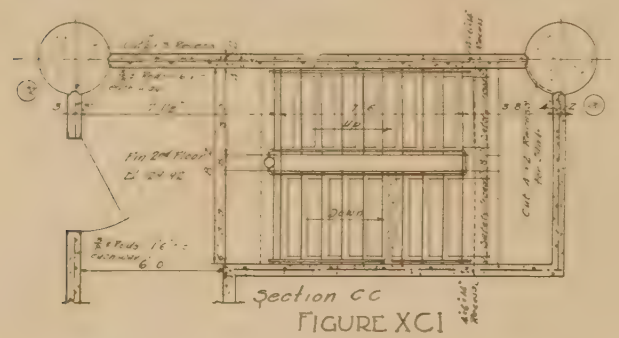


FIGURE XCI

purpose of finding the proper moment. In this connection it may be well to note that some engineers use the formula $M = \frac{1}{8}\, wl^2$ in which $w$ is used to denote the *unit* load, which in this case is 211 pounds. They also combine this with the formula $M = f_s \times \frac{7}{8} \times d$ in order to determine $f_s$, the stress in the steel, in one operation of the slide rule. Combined, these two formulas become

$$f_s = \frac{w \times l^2}{8 \times \frac{7}{8} \times d}$$

In order to simplify the calculations still more and to find $A_s$—the area of the steel—in one operation, the value of steel in tension, or 16,000 pounds per square inch, is introduced into the denominator. The formula then becomes

$$A_s = \frac{w \times l^2}{8 \times \frac{7}{8} \times d \times 16{,}000}$$

Now $\frac{7}{8} \times 16{,}000$ equals 14,000 pounds, so the formula may be simplified to

$$A_s = \frac{w \times l^2}{8 \times d \times 14{,}000}$$

As $L$ is usually given in feet rather than inches, it further simplifies the problem to have the formula written as follows:

$$A_s = \frac{w \times L^2 \times 12}{8 \times d \times 14{,}000}$$

In this formula the length of the span is written in feet, and as 12 divided by 8 becomes 1.5, the final form of the formula becomes

$$A_s = \frac{w \times L^2 \times 1.5}{d \times 14{,}000}$$

The only step which remains to be taken is the determination of $A_s$ in the problem under consideration. As has been stated $w$ equals 211 pounds per square foot. The distance between supports has been found to be 8.6 feet. This is represented by $L$. If $t$ is taken as $5\frac{1}{2}$ inches, then $d$ becomes $4\frac{1}{4}$ inches. Substituting in the formula, the following problem can be carried through very quickly by the use of the slide rule.

$$A_s = \frac{211 \times 8.6 \times 8.6 \times 1.5}{4.25 \times 14{,}000} = .39$$

A $\frac{3}{8}$-inch square bar has a sectional area of .1406 square inch, and there will be required 2.76 in each foot of slab, or if these bars are spaced $4\frac{1}{4}$ inches on centres the required area will be supplied. It will be noticed in the figure that the bars are spaced $4\frac{1}{2}$ inches on centres. This is due to the fact that when the actual dimensions were determined it was found that for a shorter span the wider spacing is all that will be required.

It will be noticed that the run of stairs from the platform to the upper floor calls for only a 5-inch slab and that the spacing is only $5\frac{1}{4}$ inches on centres. This is due to the fact that the span is shorter.

The next step is the design of the beam noted as *B2* in Figure XCII. The depth of this beam is determined to a certain extent by the point of intersection of the stair slab with the beam. It cannot be less than 1 foot 2 inches, as shown in the figure. To determine the load per lineal foot which is supported by the beam, it will be necessary to add one-half the stair load, one-half the load of the slab, and the weight of a foot of beam.

The stair load was found to be per square foot 211 pounds. One-half the horizontal span of the stair will be assumed to be 4 feet, so the load per foot of beam due to the stair will be 844 pounds. The slab at the platform will be a 4-inch slab, which will weigh 48 pounds per square foot, and if the live load of 100 pounds is added the unit slab load will be 148 pounds. The clear span of the slab is 3 feet 2 inches, so the load per foot due to the slab is $148 \times 1.6 = 237$ pounds. The beam will be assumed to be 6 inches wide and 14 inches deep, and will weigh $6 \times 14 = 84$ pounds per foot, and the addition of 50 pounds live load will give a total of 134 pounds. The total load per foot of beam will be as shown below.

| | | |
|---|---|---|
| Stair load | 844 | pounds. |
| Slab " | 237 | " |
| Beam " | 134 | " |
| | 1,215 | " |

By substituting in the formula given above, the area of steel required in the beam can be found directly.

$$A_s = \frac{1{,}215 \times 8.66 \times 8.66 \times 1.5}{12 \times 14{,}000} = .81$$

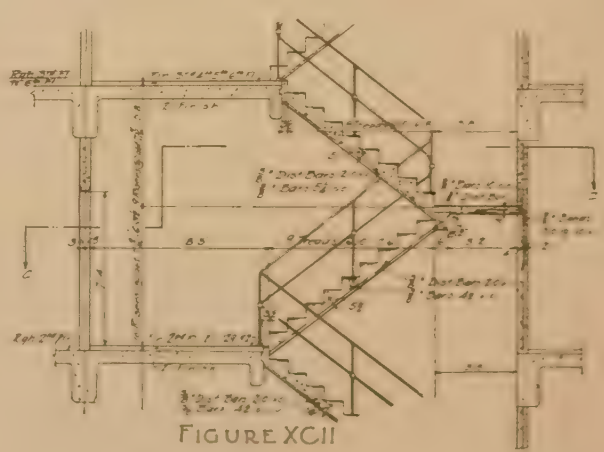

FIGURE XCII

This area can be supplied if two $\frac{3}{4}$-inch round rods are used.

The only remaining calculation is the one required for the design of the slab at the platform. The span of this slab is so short and the load is so light that the problem resolves itself into determining the smallest practical bar to be used and the largest allowable spacing. As all the bars throughout the construction of all the stairs have been $\frac{3}{8}$-inch square bars these will be used in the slab construction. As the maximum spacing according to law is two and one-half times the thickness of the slab, this spacing will be made 10 inches, as shown in the figure. This reinforcement is more than enough to support the load on the slab.

An interesting feature of the particular stair construction found in the 395 Hudson Street Building is that all the stair shafts are inclosed in 6-inch reinforced concrete walls. These walls support the stair platform and it will be noted in Figure XCI that a recess is called for measuring $4 \times 6 \times 14$ inches to act as supports for the beam in the walls, and that a recess is left in the column for the slab.

Bond bars must be left in beams corresponding to *B*15, Figure XCIII, and in the wall as shown in Figure XCII. In case the platform is not carried on the wall, then struts must be provided to carry the platform beams.

This completes the study of the typical stair construction and, as the principles outlined with regard to this design are common to the design of all the stairs, it is unnecessary to investigate the design of the other stairs in the building.

This also completes the study of the design of the 395 Hudson Street Building. In this study there has been investigated the actual design of slabs, beams, girders, columns, footings, flat slabs, basement walls, and stair construction—practically every type of design that an engineer encounters in every-day practice. There are, of course, special problems which will be encountered in the design of almost every building, and which cannot be touched upon in a work of this kind. The problems which have been outlined have shown the use of principles which can be applied to all the problems encountered in general practice, however, and it is difficult to bring to mind any type of construction found in the ordinary building which cannot be solved by the use of these principles.

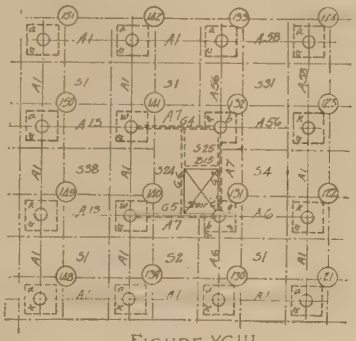

FIGURE XCIII

# Announcements

We have been much interested in reading an article by Mr. Ernest M. Skinner, on "The Proper Placing of Organs in Public Buildings." The problem is one for an expert to solve, and Mr. Skinner qualifies in this respect. He has some valuable suggestions for those who are building movie theatres and other places of public entertainment.

Mr. Peter Campbell, treasurer of the Nairn Linoleum Company, of Newark, N. J., sailed recently for a visit to Kirkcaldy, Scotland, where was established the original linoleum business of Michael Nairn & Co., Ltd. He will visit France and spend some time in London in connection with the joint affairs of the Greenwich Linoleum Co., recently consolidated with the Michael Nairn Co.

"Copper Roofing—Information for Architects and Roofing Contractors," is the title of a booklet just published by the Copper and Brass Research Association. It contains general information about copper, including a table of weights of various roofing materials for each 100 square feet laid, 16-ounce standing seam copper weighing 125 pounds, and copper shingles 84 to 100 pounds to the square, as compared with 1,200 to 1,800 pounds for shingle tile, 450 to 675 pounds for slate, and 300 to 650 for asbestos shingles. The use of copper on flat roofs, as well as the ribbed seam and standing seam methods, is discussed. Information concerning copper shingles, flashings, gutters, and eaves-trough is also given, together with some suggestions concerning the natural coloring of copper, a peculiar advantage which copper has over other roofing materials. Condensed specifications covering copper roofing, cornices, flashings, etc., are supplied, accompanied by four drawings, containing 26 figures giving helpful detail. The booklet is compact and thoroughly indexed. Copies are furnished by the Building Service Department of the Copper and Brass Research Association, 25 Broadway, New York, and in a prefatory note the services of that department are offered to architects and roofing contractors.

Benton S. Russell, architect, advises us that his address is now 1948 Grand Central Terminal, New York, N. Y., and desires manufacturers' catalogues and samples.

Benjamin Driesler announces that he has removed his office to 186 Remsen Street, Brooklyn (Temple Bar Annex) room 702, where he will continue his profession as an architect in association with Wm. C. Winters, 106 Van Sicklen Avenue. Tel. Main 4135—same as before.

The B. F. Sturtevant Company, Boston, have favored us with an interesting article, "Catch the Cinders," descriptive of their new Cinder Eliminating Fan. The fan may be adapted to collect many other kinds of material.

We have received from The Barrett Co. their booklet on "Holt Roof Leader and Vent Connections." It explains just what the Holt Roof Connections are, that they are designed for use with either kind of flat roof or saw-tooth construction, and for any place where there are vent pipes, leader lines, steam-stacks, flag-poles, any fixtures passing through roofs which require flashings. It minutely describes the eight types of Barrett Holt Roof Connections, and shows half-tone illustrations of the connections, together with a cross-section view of each type.

The "Little Giant" Pipe wrench, a new wrench with several interesting improvements, has just been put on the market. The "Little Giant" wrench has the "end opening" feature which is familiar to users of machinists' wrenches. Its application to pipe-turning can readily be seen. The new wrench is a product of the Greenfield Tap & Die Corporation, Greenfield, Mass., "Little Giant" is one of their trade-marks, well known throughout the trade to all users of screw-plates, taps, and dies.

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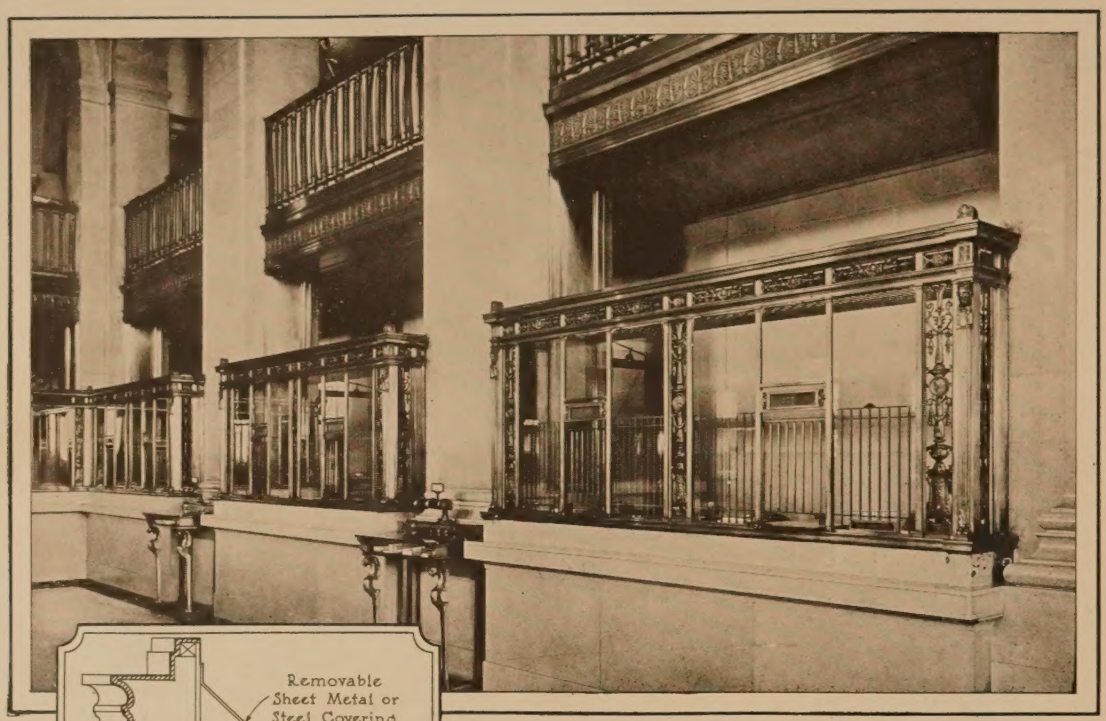
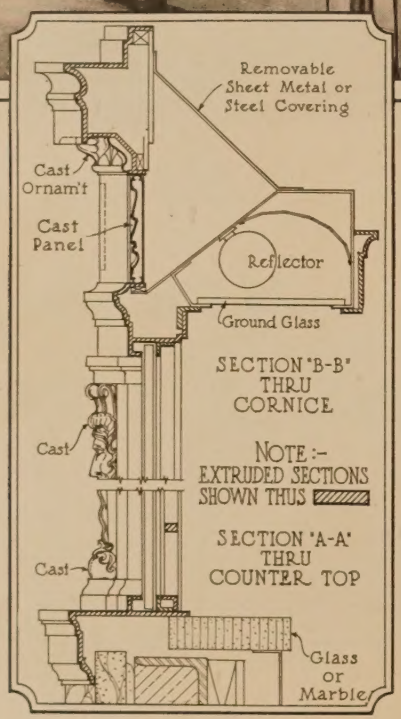


*Counter Screen of the Astor Trust Company, New York. Charles E. Birge, Architect. Fabricated by the Gorham Company from Anaconda extruded architectural bronze.*

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